Vol. 1031 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

June 14, 1983 Volume 1031 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

Dec. 3, 1982.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,147,836, Re. S.N. 243,359, Filed Mar. 13, 1981, Cl. 164/428, POLYESTER COATED PAPERBOARD FOR FORMING FOOD CONTAINERS AND PROCESS FOR PRODUCING THE SAME, Lee J. Murray, Jr., Owner of Record: *American Can Co., Greenwich, Conn.,* Attorney or Agent: Robert P. Auber, et al., Ex. Gp.: 164

4,255,717, Re. S.N. 473,304, Filed Mar. 8, 1983, Cl. 331/94.508, MONOLITHIC MULTI-EMITTING LASER DEVICE, Donald R. Scifres, et al., Owner of Record: *Xerox Corp., Stamford, Conn.,* Attorney or Agent: Ronald Zibelli, Ex. Gp.: 252

4,345,464, Re. S.N. 480,278, Filed Mar. 30, 1983, Cl. 73/201, CENTERING DEVICE FOR FLOMETERS INTERPOSED IN FLOW LINE, Peter J. Herzl, et al., Owner of Record: *Fischer & Porter Co., Warminster, Pa.,* Attorney or Agent: None, Ex. Gp.: 244

4,374,741, Re. S.N. 481,494, Filed Apr. 1, 1983, Cl. 252/34, POLYAMIDE AND FUNCTIONAL FLUID CONTAINING SAME, Walter E. Rieder, Owner of Record: *Cincinnati Milacron., Inc., Cincinnati, Ohio,* Attorney or Agent: C. Richard Eby, et al., Ex. Gp.: 116

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,588,039, Reexam. No. 90/000,374, Requested: May 5, 1983, Cl. 251/141, SOLENOID VALVE STRUCTURES AND SYSTEMS, Stephen V. Chelminski, et al., Owner of Record: *Inventor,* Attorney or Agent: Roland T. Bryan, Ex. Gp.: 341, Requester: Mark Precision Corp., Houston, Tex.

3,982,383, Reexam. No. 90/000,369, Requested: May 2, 1983, Cl. 56/11.6, HARVESTING PLATFORM WITH A FLOATING CUTTER BAR, Roger E. Mott, Owner of Record: *Deere & Co., Moline, Ill.,* Attorney or Agent: H. Vincent Harsha, Ex. Gp.: 330, Requester: Striker, Striker & Stenby, New York, N. Y.

4,047,608, Reexam. No. 90/000,377, Requested: May 9, 1983, Cl. 400/208, COMPLAINT RIBBON-GUILDING STRUCTURE, Frederick P. Willcox, Owner of Record: *Inventor,* Attorney or Agent: William D. Hall, Ex. Gp.: 330, Requester: Exxon Research & Engineering Co., Florham Park, N. J.

4,232,179, Reexam. No. 90/000,378, Requested: May 9, 1983, Cl. 585/640, PROCESS FOR PREPARING ETHENE, Helcio V. Valladares Barracas, et al., Owner of Record: *Petroleo Brasiliero S. A., Rio de Janeiro, Brazil,* Attorney or Agent: Norbert P. Holler, Ex. Gp.: 116, Requester: The Halcon SD Group, Inc., New York, N. Y.

4,243,681, Reexam. No. 90/000,381, Requested: May 11, 1983, Cl. 424/330, ALKYLTHIOPHENOXYPROPANOLAMINES AND PHARMACEUTICAL COMPOSITIONS AND USES THEREOF, Duane F. Morrow, et al., Owner of Record: *Mead Johnson & Co., Evansville, Ind.,* Attorney or Agent: Robert H. Uloth, Ex. Gp.: 120, Requester: Continental Pharma S. A., Brussels, Belgium

4,275,727, Reexam. No. 90/000,379, Requested: May 10, 1983, Cl. 604/66, DEVICE FOR MONITORING AND CONTROLLING SELF-ADMINISTERED INTRAVENOUS DRUG DOSAGE, Michael Keeri-Szanto, Owner of Record: *Inventor,* Attorney or Agent: Fetherstonhaugh & Co., Ex. Gp.: 330, Requester: C. R. Bard, Inc., Murry Hill, N. J.

4,321,956, Reexam. No. 90/000,373 Requested: May 2, 1983, Cl. 152/222, BELT ATTACHMENT FOR TIRE CHAINS, Rene Martinelli, Owner of Record: *Burns Bros., Portland, Oreg.,* Attorney or Agent: John P. Dellett, Ex. Gp.: 160, Requester: Owner

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Department of the Treasury
United States Customs Service

19 CFR Part 133

Application for Recordation of Trade Name: "UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF THE PLUMBING AND PIPE FITTING INDUSTRY OF THE UNITED STATES AND CANADA"

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF THE PLUMBING AND PIPE FITTING INDUSTRY OF THE UNITED STATES AND CANADA," used by the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada, an unincorporated association, located at 901 Massachusetts Ave., N.W., Washington, D.C. 20001.

The application states that the trade name is used by the Association to identify its union activities, which include the formation of local labor unions in the plumbing and pipe fitting industry, as well as certifying (1) that pipe, fabricated pipe, welded pipe and fabricated welded pipe formations were made by members of United Association's local unions and (2) that the services of fabricating and assembling such goods were performed by members of United Association's local unions. The Association's member unions and their members are authorized to use the trade name in the United States and Canada.

Before final action is taken on the application, consideration will be given to any relevent data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before July 11, 1983.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave. NW., Rm. 2417, Washington, D.C. 20229.

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave. NW., Washington, D.C. 20229 (202-566-5765).

A. PIAZZA,
May 4, 1983. *Acting Director, Entry Procedures and Penalties Division.*

Department of the Treasury
United States Customs Service

(T.D. 83-61)
19 CFR Part 133.12
Recordation of Trade Name:
THE BAYER COMPANY

Agency: Customs Service, Treasury

Action: Notice of Recordation of Trade Name: THE BAYER COMPANY

Summary: On Sept. 14, 1982, a notice of application for the recordation under section 42 of the Act of July 15, 1946, as amended (15 U.S.C. 1124), of the trade name "THE BAYER COMPANY" was published in the Federal Register (47 FR 40519). The notice advised that prior to final action on the application, filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), consideration would be given to relevant data, views, or arguments submitted in opposition to the recordation and received not later than Nov. 14, 1982. No responses were received in opposition to the application.

The name "THE BAYER COMPANY" is hereby recorded as the trade name used by Sterling Drug Inc., a corporation organized under the laws of the State of Delaware, 90 Park Ave., New York, N.Y. 10016. The trade name is used in connection with pharmaceuticals manufactured in Canada, West Indies and the United States. Sterling Drug Ltd. of Aurora, Canada, is authorized to use the trade name.

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

DONALD W. LEWIS,
Mar. 10, 1983. *Director, Entry Procedures and Penalties Division.*

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

GEORGE KUDRAVETZ,
Program Manager,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-272,842. (4,376,633). ZWITTERION COMPOUNDS AS CATALYSTS IN EASY-CARE FINISHING.
SN 6-455,727. A METHOD FOR THE CONTROL OF INSECTS.

DEPARTMENT OF HEALTH & HUMAN SERVICES

SN 6-457,266. METHOD OF DIFFERENTIATING KILHAM STRAIN MUMPS.
SN 6-468,950. 2,5-RIBOADENYLATE-MORPHOLINOADENYLATE NUCLEOTIDES.
SN 6-475,215. MULTI-LAYER COIL ASSEMBLY MOUNTED AROUND THE ROTARY AXIS FOR PREPATORY COUNTER-CURRENT CHROMATOGRAPHY.
SN 6-480,142. CELL LINES SECRETING ANTI-INSULIN ANTIBODIES AND TEST KITS.

DEPARTMENT OF INTERIOR

SN 6-460,102. RECOVERY OF METALS FROM GRINDING SLUDGES.
SN 6-460,201. SEPARATION OF LITHIUM FROM ALUMINUM AND SODIUM.
SN 6-455,187. UNIVERSAL RIPPER MINER.

Requirement for a Response Under 37 CFR 1.136 and 1.137 Where a Continuing Application is Being Filed.

This notice is intended to clarify the requirements for a response as required by 37 CFR 1.136 or 1.137 in situations involving a petition for extension of time or a petition to revive an abandoned application for the purpose of filing a continuing application.

In those instances where an extension of time or a revival of an abandoned application is sought solely for the purpose of filing a continuing application under 35 U.S.C. 120 and where the prior application is to be abandoned in favor of the continuing application, the fil-

ing of a response as required by 37 CFR 1.111, 1.113, 1.192 or other regulation is considered to be an unnecessary expenditure of resources by the applicant. Accordingly, in these situations, the Patent and Trademark Office will accept the filing of a continuing application as a response under 37 CFR 1.136 or 1.137.

To facilitate processing by the Office, any such petition for extension of time or petition to revive should specifically refer to the filing of a continuing application and also include an express abandonment of the prior application conditioned upon the granting of the petition and the granting of a filing date to the continuing application.

GERALD J. MOSSINGHOFF,
May 13, 1983. *Commissioner of Patents and Trademarks.*

Adverse Decisions in Interference

Patent No. 3,888,804, Carl E. Swanholm and Robert G. Caldwell, PHOTODEGRADABLE HYDROCARBON POLYMERS, Interference No. 99,902, decided Mar. 10, 1983, claim 1.

Patent No. 4,096,589, Morton I. Goldstein, ADJUSTABLE EYE SHADE, Interference No. 100,796, decided Mar. 4, 1983, claims 1 & 2.

Patent No. 4,152,445, Gordon Wootton, 1-(3-HYDROXYALK-1-YL)-5-(CARBOXYALKYL) HYDANTOIN DERIVATIVES, Interference No. 100,772, decided Mar. 22, 1983, claims 1–22.

Patent No. 4,160,614, Stephen F. Koval, EXPANSION SHELL ASSEMBLY AND METHOD FOR COMBINING RESIN BONDING AND MECHANICAL ANCHORING OF A BOLT IN A ROCK FORMATION, Interference No. 100,743, decided Mar. 11, 1983, claims 1–4, 6 and 9–13.

Patent No. 4,168,900, Iwao P. Adachi, COMPACT ERECT OPTICAL IMAGING COPIER SYSTEM AND METHOD, Interference No. 100,762, decided Mar. 17, 1983, claims 1–4, 8, 10, 12, 13, & 17.

Patent No. 4,203,993, Eric M. Gordon, 6α -BROMOPENICILLANIC ACID SULFONE, Interference No. 100,886, decided Mar. 4, 1983, claims 1 & 2.

Patent No. 4,240,767, Bert E. Gracia, VALVING METHODS AND APPARATUS FOR FLOODING AND GROUTING OFFSHORE JACKET SLEEVES, Interference No. 100,919, decided Jan. 27, 1983, claims 1, 4 & 24.

Patent No. 4,276,726, David L. Derus, COLLAPSABLE, ARTICULATED WALL STRUCTURE, Interference No. 100,916, decided Mar. 7, 1983, claims 1, 2, 4–8, 10, 12, 13, 15, 18, 21 & 28.

Patent No. 4,308,752, Eggert Appel and Peter Nissen, MAGNETIC FLOWMETER, Interference No. 100,942, decided Mar. 22, 1983, claims 1 & 4.

NANNIE B. HENRY,
Deputy Clerk
Board of Patent Interferences.

PATENT NOTICES

Certificates of Correction for the Week of June 14, 1983

D. 221,370	4,332,976	4,362,820	4,371,890
4,068,079	4,333,336	4,363,042	4,372,458
4,090,236	4,340,208	4,363,162	4,372,757
4,237,007	4,341,325	4,363,678	4,373,088
4,243,814	4,342,766	4,363,821	4,373,796
4,257,911	4,342,963	4,363,922	4,373,835
4,269,991	4,343,973	4,364,099	4,374,317
4,273,468	4,347,127	4,364,372	4,374,451
4,281,408	4,347,174	4,365,074	4,374,819
4,293,675	4,348,287	4,366,146	4,375,820
4,294,989	4,348,770	4,366,618	4,376,358
4,300,988	4,349,152	4,367,037	4,377,073
4,303,742	4,349,626	4,367,844	4,377,390
4,306,289	4,350,644	4,368,091	4,377,953
4,307,461	4,352,484	4,368,504	4,378,205
4,310,511	4,353,190	4,369,021	4,378,235
4,315,161	4,356,552	4,369,425	4,378,331
4,315,445	4,357,011	4,369,502	4,378,603
4,325,938	4,357,095	4,369,885	4,378,955
4,327,929	4,357,673	4,370,143	4,379,121
4,329,030	4,358,592	4,370,446	4,379,307
4,329,361	4,359,235	4,370,775	4,379,512
4,329,402	4,360,420	4,371,722	
4,330,647	4,362,356	4,371,780	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director 1-16-81
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.

GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director 11-20-81
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Stercids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.

HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director 3-1-82
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.

COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director 3-09-82
Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.

SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—
R. F. WHITE, Director 1-12-82
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director 5-22-81
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.

SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director 3-30-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.

INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director 1-05-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.

RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—
G. M. FORLENZA, Director 5-12-81
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.

ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director 8-25-80
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.

DESIGN, GROUP 290—KENNETH L. CAGE, Director 1-30-81
Industrial Arts; Household, Personal and Fine Arts.

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director 5-18-81
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.

MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director 7-27-81
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.

AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—
R. E. AEGERTER, Director 8-27-82
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.

HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director 11-17-80
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.

GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—
A. L. SMITH, Director 9-17-80
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive
Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

June 14, 1983

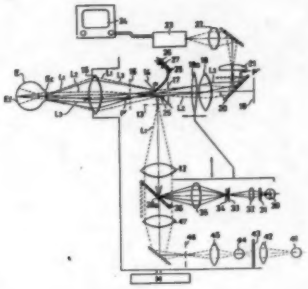
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,196,979 (94th)

METHOD AND DEVICE FOR DETECTING DISTANCE BETWEEN EYE-EXAMINING INSTRUMENT AND EYE

Yoshimi Kohayakawa; Isao Matsumura, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Reexamination Request No. 90/000,117, Nov. 30, 1981.
Reexamination Certificate for Patent No. 4,196,979, issued Apr. 8, 1980, Ser. No. 832,827, Sep. 13, 1977.
Claims priority, application Japan, Oct. 16, 1976, 51-124289; May 30, 1977, 52-63065.
U.S. Cl. 351/208 Int. Cl.³ A61B *3/14*



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **13**, **14**, and **22** is confirmed.

Claims **1**, **11**, and **15** are determined to be patentable as amended:

Claims **2–10**, **12**, and **16–21** dependent on amended claims, are determined to be patentable.

New claims **23–35** are added and determined to be patentable.

1. A device for detecting the distance between an eye-examining instrument and an eye comprising:

an inspecting system for inspection of a human eye, said system having a front optical means confronting the human eye;

means for forming at least one index; and

said front optical means being arranged for converging a beam of light emitted from said index to a degree required for illumination of the front part of the human eye with the beam of light and also allowing said front optical means to converge, substantially on an image surface of said front optical means, a beam of light reflected by the front of the human eye arranged at a predetermined position[.] *and the image surface of the front optical means being out of the condition of being conjugate to the front of the human eye with respect to the front optical means.*

B1 4,355,032 (95th)

9-(1,3-DIHYDROXY-2-PROPOXYMETHYL)-GUANINE AS ANTIVIRAL AGENT

Julien P. Verheyden, Los Altos; John C. Martin, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Reexamination Request No. 90/000,299, Oct. 21, 1982.
Reexamination Certificate for Patent No. 4,355,032, issued Oct. 19, 1982, Ser. No. 267,210, May 21, 1981.
U.S. Cl. 424/253 Int. Cl.³ C07D *473/18*

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

1. The compound 9-(1,3-dihydroxy-2-propoxymethyl)guanine and the pharmaceutically acceptable salts thereof.

B1 3,400,012 (96th)

PROCESS OF PLATING METAL OBJECTS

Michael Golben, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Reexamination Request No. 90/000,093, Oct. 19, 1981.
Reexamination Certificate for Patent No. 3,400,012, issued Sep. 3, 1968, Ser. No. 374,151, Jun. 10, 1964.
U.S. Cl. 427/242 Int. Cl.³ B05D *3/12*

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–11** having been finally determined to be unpatentable, are cancelled.

1. A galvanomechanical process for plating a thin continuous layer of silverly metal on each of a number of small metal parts, comprising the steps of providing in a tumbling barrel

water,

said metal parts,

impact media,

a water-soluble salt of said silvery metal,

a small amount of a powdered driving metal which is less noble than either said silvery metal or the metal of said parts, and

an agent which will render the pH of the liquid barrel contents such as will dissolve the driving metal, and

rotating said barrel to agitate the contents thereof exposed to the atmosphere, whereby the metal parts are contacted, substantially over their entire exposed surfaces and including such difficultly accessible areas as thread roots, by the remaining contents of said barrel for a brief time on the order of ten minutes or less.

REISSUES

JUNE 14, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,272

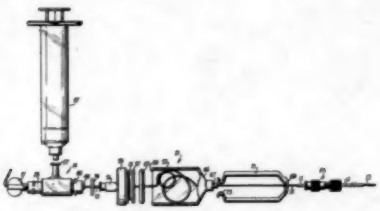
CATHETER DELIVERY SYSTEM AND METHOD

Paul H. Pevsner, 4121 King Crest Pkwy., Richmond, Va. 23221

Original No. 4,159,022, dated Jun. 26, 1979, Ser. No. 790,622, Apr. 25, 1977. Application for reissue Dec. 31, 1979, Ser. No. 108,937

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—28 **18 Claims**



16. A catheter delivery system for delivering an elongated miniature cannula-type catheter to a body of a mammal and controlling the movement of the catheter tip in the mammal's body, the system comprising:

a miniature cannula-type catheter having a proximal end and a distal end;

said catheter delivery system further comprising a conduit system including:

a hollow cannula delivery housing defining a relatively large cavity for receiving gathered portions of said cannula-type catheter therein, said cannula delivery housing having an inlet opening and an outlet opening positioned on opposite sides of the cavity, said cannula delivery housing further including a tubular means at the outlet opening for attaching said cannula delivery housing to a mammal's blood vessel to communicate the cavity with said blood vessel and thereby allow said cannula-type catheter to extend through said outlet opening of said cannula delivery housing into said mammal's body;

a hollow cannula-control member mounted at said inlet opening, said hollow cannula-control member having first and second openings therein positioned to allow said cannula-type catheter to extend through said hollow cannula delivery housing and said hollow cannula control member, said hollow cannula control member and said hollow cannula delivery housing being attached to one another at their respective second and inlet openings, said cannula control member further including a clamping seal for selectively clamping said cannula control member to said cannula-type catheter to create a seal preventing fluid flow between said first and second openings about said cannula-type catheter and for releasing said cannula-type catheter to allow longitudinal movement of said cannula-type catheter through said first and second openings by means of a hand manipulation applied to said cannula-type catheter outside of said first opening; and

a coupling means for coupling a fluid source to the interior of said conduit system on the distal side of said clamping seal.

Re. 31,273

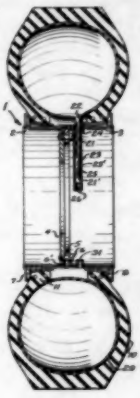
CURING RIM

Harold S. Peterson, Fargo, N. Dak., assignor to Bruuick Mfg. Co., Fargo, N. Dak.

Original No. 4,051,881, dated Oct. 4, 1977, Ser. No. 666,687, Mar. 15, 1976. Application for reissue Oct. 12, 1979, Ser. No. 84,528

Int. Cl.³ B60C *25/06*

U.S. Cl. 157—1.1 **3 Claims**



7. A method of supporting a vehicle tire during a curing operation comprising the steps of:

mounting a vehicle tire having an inner tube on the periphery of a rim;

introducing a predetermined pressure into said inner tube for inflation thereof for seating the bead of the vehicle tire in sealed relationship on the rim; and

introducing pressure greater than said predetermined pressure into said vehicle tire between the interior of the tire and the outer periphery of the inner tube to exhaust said predetermined pressure from the inner tube and bias said tire in position during a curing operation.

Re. 31,274

ENGINE COOLING SYSTEM FLUSHING APPARATUS AND METHOD

John A. Babish, Glendora; Larry K. Arnot, Duarte, and Douglas C. Appel, Glendora, all of Calif., assignors to Wynn Oil Company, Fullerton, Calif.

Original No. 4,109,703, dated Aug. 29, 1978, Ser. No. 741,065, Nov. 11, 1976. Application for reissue Jan. 10, 1980, Ser. No. 110,923

Int. Cl.³ F28G *9/00*; F02B *77/04*

U.S. Cl. 165—95 **13 Claims**

19. For combination with an internal combustion engine cooling system that includes a liquid coolant heat radiator and a liquid coolant pump connected with coolant passages of an engine, and a heater having a liquid coolant passage connected with the engine coolant passages, flushing apparatus comprising:

(a) first means to produce a pressurized flow of flushing liquid and entrained gas bubbles,

(b) a series of flow ports selectively connectible to different points in said system, utilizing appropriate adaptors, the series including a first port selectively connectible to the radiator, a

second port selectively connectible to the heater, and a third port selectively connectible to the coolant pump, and

(c) control means operable to direct said flow from said first means and via said ports in four separate modes, identified as follows:

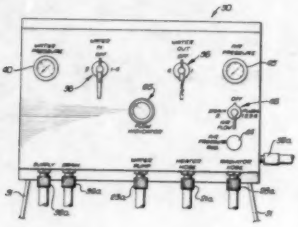
(i) through the radiator in a reverse direction,

(ii) through the engine coolant passages in a reverse direction,

(iii) through the radiator in a forward direction,

(iv) through the engine coolant passages in a forward direction,

flow also passing through the heater in some of said modes, and



(d) said control means including a primary valve connected to receive said flow in the form of pressurized liquid and air bubbles, said valve having three outlets respectively connected with said first, second and third ports, there being a drain port, and said control means also including a secondary valve having three inlets respectively connected with said first, second and third ports, said secondary valve having a discharge port connected with the drain port, operation of said primary and secondary valves characterized as controlling said flow in said four separate modes.

Re. 31,275

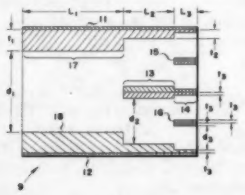
ZENO DUCT SOUND ATTENUATING MEANS

Leslie S. Wirt, Newhall, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Original No. 4,109,750, dated Aug. 29, 1978, Ser. No. 799,953, May 24, 1977. Application for reissue May 26, 1981, Ser. No. 266,715

Int. Cl.³ F01N *1/04*

U.S. Cl. 181—224 **22 Claims**



15. A sound attenuating duct comprising:

means defining an elongate flow passage of substantially uniform cross-sectional area throughout and a lesser transverse dimension d which varies along the length of said flow passage; and,

sound absorptive means located within said passage defining means, and wherein the acoustical resistance of said absorptive means measured in rayls equals approximately 0.9 (df/c) pc, and the acoustical reactance X of said duct measured in rayls equals approximately −0.8 (df/c) pc, *and the product df is kept essentially constant,* where d equals the lesser transverse dimension of said flow passage, f equals the frequency of local maximum attenuation, c equals the speed of sound in the medium within the duct, and p equals the density of said medium, whereby R and X remain essentially constant throughout the length of said flow passage.

Re. 31,276

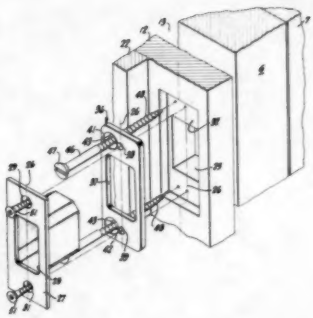
LOCK STRIKE CONSTRUCTION

Ernest L. Schlage, Burlingame, Calif., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Original No. 4,065,162, dated Dec. 27, 1977, Ser. No. 724,929, Sep. 20, 1976. Application for reissue Dec. 26, 1979, Ser. No. 106,498

Int. Cl.³ E05C *21/02*

U.S. Cl. 292—340 **5 Claims**



1. A lock strike construction for use with a wall having an upright structural cripple and an upright door casing side rail parallel to and separated from said cripple by an intervening space comprising an elongated planar plate having a longitudinal axis, means defining an elongated bolt opening [entirely enclosed] in said planar plate and extending along and substantially symmetrical with said axis, means forming a pair of screw-receiving circular holes in said planar plate on said axis and on opposite ends of said bolt opening, means forming a pair of screw rod holes in said planar plate both on one side of said axis and on opposite ends of said bolt opening, a pair of screw rods in said screw rod holes and extending through said side rail and through said space and into said cripple, *said planar plate including means on the door-opening side thereof forming a continuous web between said screw rod holes toward the direction of door opening,* a strike plate abutting said planar plate and said screw rods and in substantial registry with said planar plate, means defining a bolt opening and screw openings in said strike plate substantially registering with said elongated bolt opening and said screw receiving holes, and screw fasteners disposed in said screw receiving holes in said strike plate freely passing through said screw receiving circular holes in said planar plate and laterally engagable by both said strike plate and said planar plate.

Re. 31,277

TELEPHONE CABLE WITH IMPROVED SHIELD COMBINATION

Anthony P. Gabriel, Staten Island, N.Y., and Jimmy Justiss, Bonham, Tex., assignors to General Cable Corporation

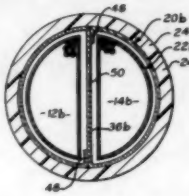
Original No. 4,165,442, dated Aug. 21, 1979, Ser. No. 914,505, Jun. 12, 1978. Application for reissue Aug. 21, 1981, Ser. No. 295,126

Int. Cl.³ H01B *11/06*

U.S. Cl. 174—36 **23 Claims**

1. A communication cable including a core containing a plurality of conductors divided into groups along a generally diametral plane through the core, a metal screen, that is a conductor of electricity, having a middle panel that extends between said different groups at said diametral plane, the middle panel of the metal screen being bent in opposite circumfer-

ential directions at the opposite ends thereof and curving around the circumferential portions of the different groups of conductors and extending circumferentially around one-half of the circumference of the core to form a portion of the screen that is of semi-circular cross-section, and each of the portions



of the screen that is of semi-circular cross-section having end portions, remote from its connection to the middle panel of the screen, said end portions being bent inward substantially parallel to the middle panel of the screen, and a layer of dielectric material on one side of the screen.

Re. 31,278

BRUSHLESS D-C MOTOR

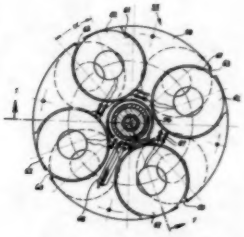
Fritz Schmider, Hornberg, Fed. Rep. of Germany, assignor to Papst Motoren GmbH & Co., KG, St. Georgen, Fed. Rep. of Germany

Original No. 4,125,792, dated Nov. 14, 1978, Ser. No. 576,650, May 12, 1975. Application for reissue Nov. 12, 1980, Ser. No. 206,159

Claims priority, application Fed. Rep. of Germany, May 18, 1974, 2424290

Int. Cl.³ H02K *3/04, 29/02*

U.S. Cl. 310—268 **78 Claims**



1. A slow speed brushless speed controlled d-c motor having a coreless stator winding and a rotary multipolar permanent magnet rotor which in operation interacts with a rotary field produced by the coreless stator winding, and a sensor arrangement controlled by the rotary position of the rotor connected to control current flow through the stator winding;

wherein the stator winding has a maximum of two magnetically active coil sections per pole of the multipolar rotor two coil sections forming a set;

the coil sections are located in two superposed layers; and a number of coil sections (62) corresponding to the number of pairs of poles are interconnected and symmetrically distributed in one layer and the same number of coil sections (63) are symmetrically distributed in the second layer of the two layer winding, the coil sections of the second layer being displaced by an angle (α) relative to the coils of the first layer;

wherein the displacement angle (α) is an odd multiple of 90°-el and the maximum width of the coils is about 360°-el;

means deriving a control signal representative of speed of rotation of the rotor;

and means controlling current flow through said stator coil sections in dependence on said control signal.

Re. 31,279

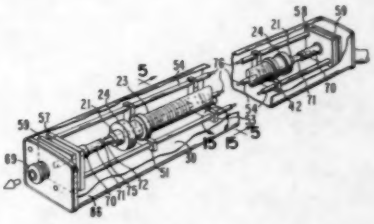
LASER OPTICAL RESONATOR

Wayne S. Mefferd, and James L. Hobart, both of Palo Alto, Calif.

Original No. 3,783,407, dated Jan. 1, 1974, Ser. No. 292,343, Sep. 26, 1972. Continuation of Ser. No. 842,956, Jul. 18, 1969, abandoned. Application for reissue Nov. 5, 1979, Ser. No. 91,121

Int. Cl.³ H01S *3/02*

U.S. Cl. 372—107 **16 Claims**



1. A laser comprising an active lasing medium, means for creating a population inversion in said lasing medium, an optical resonator including a pair of reflectors aligned with each other and about the active lasing medium to form the optical beam path of the laser and for stimulating the emission of radiation along said path, a pair of reflector adjustment plates in which said reflectors are mounted, and means for accurately positioning and aligning said reflectors including at least three spaced-apart rods made of a material having a low thermal coefficient of expansion, the rods extending parallel with but displaced from the optical path, the outer ends of the rods being coupled to the reflector adjustment plates, sleeves surrounding [at least a part of each of the rods and] *each of said rods over the entire length and said rods are segmented and are coupled together by fixed bearings within each sleeve and each sleeve* being made of a material of high thermal conductivity for minimizing thermal gradients along said rods, and means positioned along said rods for thermally coupling by thermal conduction said sleeves for minimizing thermal gradients both among and along said sleeves and said rods.

PLANT PATENTS

GRANTED JUNE 14, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,060

ROSE PLANT — MEIROTERVI VARIETY

Marie L. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Nov. 18, 1981, Ser. No. 322,583
Claims priority, application France, Dec. 8, 1980, 2876
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant, substantially as illustrated and described, having (a) a vigorous upright growth habit, (b) the ability to form in abundance double flowers of firm petal substance which are brilliant luminous red in coloration borne on substantially straight stems and which are long lasting and substantially resistant to color change, (c) the ability to form glossy dark green foliage, and (d) the presence of a large number of thorns.

5,061

CHRYSANTHEMUM PLANT

Fred Hartman, 867 Dickson St., Kirkwood, Mo. 63122

Filed Oct. 29, 1981, Ser. No. 316,393
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct cultivar of chrysanthemum plant known by the cultivar name Hartmann's Radiance, as described and illustrated, and particularly characterized by its reddish bronze flower color and standard incurved form.

PATENTS

GRANTED JUN. 14, 1983

ERRATA

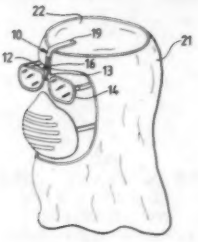
For CLASS	See PATENT NO.
604–333	4,387,712
604–333	4,387,713
604–009	4,387,715
494–081	4,387,848
340–682	4,387,937
123–555	4,388,292
382–008	4,388,610

PATENTS

GRANTED JUNE 14, 1983

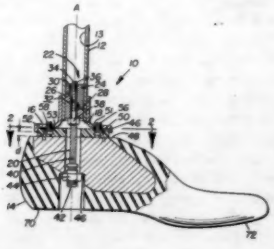
GENERAL AND MECHANICAL

4,387,471
RETAINER FOR SURGEON'S EYE GLASSES
Herbert H. Hsu, and Inri Tan-Hsu, both of 3745 Woodvale Rd., Birmingham, Ala. 35223
Filed May 18, 1981, Ser. No. 264,570
Int. Cl.³ A61F *9/00;* **B32B** *3/06;* **A61M** *15/00*
U.S. Cl. 2—10 **2 Claims**



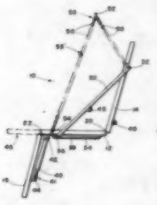
1. In a retainer for detachably connecting a surgeon's eye glasses having a nose bridge to a surgical hood,
(a) an elongated flexible tape-like member of a length for one end portion thereto to extend around said nose bridge and overlap an adjacent portion of said tape-like member with the other end portion of said tape-like member extending upwardly over a superjacent portion of said hood,
(b) cooperating surfaces carried by said one end portion and said adjacent portion and adapted to face each other while said one end portion overlaps said adjacent portion with hook-like members carried by one of said cooperating surfaces in position to engage a felt-like material carried by the other of said cooperating surfaces to detachably connect said one end portion to said ajacent portion with said nose bridge secured therebetween, and
(c) an area of adhesive carried by said other end portion of said tape-like member in position to detachably connect said other end portion to said superjacent portion of said hood with said tape-like member limiting downward movement of the glasses and retaining them in place.

4,387,472
TORQUE ABSORBER WITH BIOFEEDBACK
Michael T. Wilson, Missouri City, Tex., assignor to Medical Center Prosthetics, Inc., Houston, Tex.
Filed Oct. 2, 1980, Ser. No. 193,129
Int. Cl.³ A61F *1/04, 1/08;* **G08B** *23/00*
U.S. Cl. 3—32 **18 Claims**



1. A prosthesis comprising:
a first member;
a second member;
means for interconnecting said first and said second members while allowing limited motion therebetween;
said interconnecting means including a resilient member disposed between said first and second member;
indicator means positioned in said resilient member for sensing a predetermined force between said first member and said second member.

4,387,473
PATIENT HANDLER
Donald F. Gettner, Charter Oak, Iowa 51439
Filed Jun. 5, 1979, Ser. No. 45,616
Int. Cl.³ A61G *7/08, 7/10*
U.S. Cl. 5—81 B **9 Claims**



9. A patient handler comprising a buttocks support panel having a substantially horizontal upper surface, a back support panel having an upper surface disposable substantially horizontal and substantially in alignment with the upper surface of said buttocks panel, for use when the patient being handled is in a prone position, said back panel having an inner end adjacent a rearward end of said buttocks panel, hinge means interconnecting said inner end of said back panel to said rearward end of said buttocks panel for the hinging of said back panel with respect to said buttocks panel about a horizontal first axis, said back panel being disposed substantially upwardly extending from said buttocks panel at a time when said panels are in a position for holding a patient in a sitting position, a limiting assembly disposed during sitting position times between a first point adjacent said back panel and spaced a substantial distance from said first axis and a second point adjacent said buttocks panel and spaced a substantial distance from said first axis, said limiting assembly having a stiff means extending between said points, attaching means attaching said stiff means to said back and buttocks panels and capable of preventing movement of said stiff means along said back panel beyond said first point and preventing movement of said stiff means along said buttocks panel beyond said second point during sitting position times, said stiff means being stiff in portions thereof between said points during sitting position times, said attaching means permitting said stiff means to move so that said back panel can be moved from its sitting times position to its prone times position, said buttocks and said back panels comprising a pair of main panels, said panels having back and forward sides facing in opposite directions from said first axis when said back and buttocks panels are in prone position, said panels having right and left sides at opposite ends of said first axis, a supporting assembly attached to said panels and suspending said panels in said sitting times positions when said panels are in said positions for sitting times, said supporting assembly being provided with right and left suspension assemblies attached to right and left sides of said main panels and a supporting bar extending from right to left and upholding upper ends of said suspension assemblies at spaced places thereon respectively, said limiting assembly having releasable holding means operatively associated with said stiff means and causing said stiff

means to hold said main panels with their upper sides in substantial alignment during prone position times, said releasable holding means comprising said stiff means having a first anchoring means thereon disposed between said points, one of said main panels having a second anchoring means thereon disposed between said points, and a releasable means for interconnecting said two anchoring means for holding said anchoring means together at prone position times, whereby at prone position times, said main panels are held together with their upper surfaces substantially in alignment and whereby when said releasable interconnecting means is released then said first and second anchoring means can move apart from each other so that said stiff means is free to assume a position extending at an acute angle with respect to the horizontal permitting said back panel to assume an upwardly extending position with respect to said buttocks panel.

4,387,474

BEEHIVE MEDICATOR

J. Calvin Schierloh, Rte. 1, Box 136-D, Santa Maria, Calif. 93454

Filed Sep. 23, 1981, Ser. No. 304,844
Int. Cl.[3] A01K *51/00*; A61M *13/00*
U.S. Cl. 6—12 R 14 Claims

1. Beehive medicator apparatus for applying powdered medication to the interior of a beehive, said apparatus comprising: a substantially L-shaped, hollow, open-ended, tubular member defining an upper substantially straight section, a lower section, and an intermediate arcuate section connecting together said upper and lower sections at substantially a right angle with respect to each other; said lower section defining a horizontally flared open end having an interior vertical dimension less than the interior diametrical dimension of said tubular member; and a lip member projecting from said flared end and substantially along the lower edge of said flared end.

4,387,475

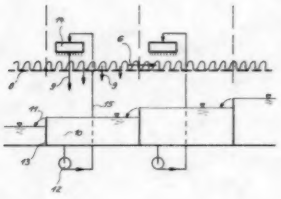
Patent Not Issued For This Number

4,387,476

METHOD AND AN APPARATUS FOR A WASHING PROCESS SUBSEQUENT TO THE SPINNING OF SYNTHETIC FIBERS

Michael Bueb, Dormagen; Robert Brück, Erftstadt-Ahrem; Edgar Muschelknautz, Leverkusen; Dieter Paulini, and Karlheinz Feltgen, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen

Filed Dec. 1, 1980, Ser. No. 212,052
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2950014
Int. Cl.[3] D06B *5/06*
U.S. Cl. 8—151.2 3 Claims



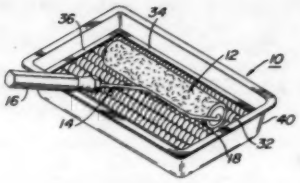
1. In a process of washing polyacrylonitrile fibers directly subsequent to a dry spinning process in which the tow is deposited in a folded condition onto a transporting device, the washing is carried out on the folded tow in counterflow on said transporting device in several stages, whereby in each stage washing liquid is sprayed onto the folded tow, the liquid trickles through the tow and through the transporting device within the stage and is then collected in a receiver below the transporting device and is returned repeatedly in the same stage while the tow is sprayed, and the tow before entering into the next stage after spraying, passes in each stage through a region in which it is dehydrated, the improvement wherein the transportation device is a vibrating conveyor which is operated with out-of-balance type drive or electromagnetic actuation, the base of which consists of perforated plates, sieve fabrics or slotted sheet metal with a 10 to 50% free cross sectional area and, according to the covering thickness, impermeable or permeable lateral walls and said folded tow and said conveyor are moved at a rate from 0.5 to 5 meters per minute while being vibrated at a vibrational frequency of 10 to 50 Hz, the tow being deposited on said vibrating conveyor at a rate from 100 to 400 meters per minute.

4,387,477

PAINT ROLLER CLEANING SYSTEM

Abraham Eisenberg, 6604 Chippewa Dr., Baltimore, Md. 21209

Filed Sep. 14, 1981, Ser. No. 302,314
Int. Cl.³ B44D 3/00
U.S. Cl. 15—104.92 8 Claims



1. A paint roller cleaning system for cleaning a paint roller, comprising:

(a) a longitudinally extended frame member having sidewalls extending around a closed periphery thereof, said frame member having a predetermined longitudinal dimension and a predetermined transverse dimension;

(b) a plurality of longitudinally extending helical coil members secured to said frame member on opposing longitudinal ends thereof, said helical coil members being located adjacent each to the other in a transverse direction when taken with respect to said longitudinal direction where said helical coil members are flexibly displaceable in (1) said transverse direction, (2) said longitudinal direction, and (3) a vertical direction when contacted by said paint roller being rolled over said helical coil members in a reciprocal transverse direction; and,

(c) a receptacle adapted to contain fluid, said frame member being insertable within said receptacle for contacting said helical coil members with said paint roller for removal of contaminants contained thereon.

4,387,478

HAND TOOLS

Morley L. Smith, Beaconsfield, Canada, assignor to T. S. Simms & Co. Limited, Saint John, Canada

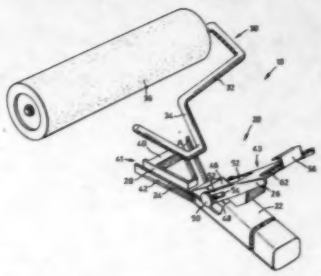
Filed Jan. 26, 1982, Ser. No. 342,783
Int. Cl.³ B05C 17/02
U.S. Cl. 15—145 2 Claims

1. In an implement handle assembly having a handle portion and first and second jaws each having a clamping face adapted to co-operate with one another to releasably engage a mounting member of an implement when disposed in a face-to-face clamping position, said first jaw being fast with respect to said handle, the improvement wherein:

(a) said first jaw has a mounting edge extending transversely of the distal end thereof, and

(b) said second jaw has a locking lip formed at the distal end thereof, said locking lip being shaped and proportion to hook around said mounting edge when said jaws are in said clamping position to lock said jaws in said clamping position, and

(c) said second jaw has its proximal end both pivotally and slidably mounted with respect to said handle whereby said



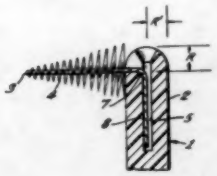
first jaw may slide between an extended position and a retracted position and may pivot between an open position and said clamping position with respect to said first jaw such that, when said second jaw is in said retracted and clamping positions, said locking lip is hooked around said mounting edge to prevent pivotal movement of said second jaw and when said second jaw is in said extended position, said second jaw is free to pivot between said clamping position and said open position.

4,387,479

INTERPROXIMAL TOOTHBRUSH

Frank Kigyos, Aurora, Ill., assignor to Block Drug Company, Inc., Jersey City, N.J.

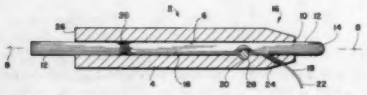
Filed May 14, 1981, Ser. No. 263,781
Int. Cl.³ A46B 9/04
U.S. Cl. 15—167 R 7 Claims



1. An interproximal toothbrush consisting essentially of an elongated handle having one end bent at an obtuse angle relative to the remainder of the handle, a bore along the central

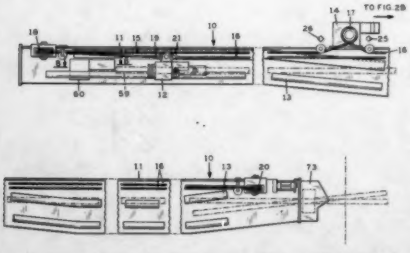
longitudinal axis of said one end extending from the terminal end thereof, an elongated bristle support having first and second portions, said first portion of said bristle support extending through the axial surface of said one end at a point displaced from the terminal end to and substantially perpendicular to said bore and then carried in that portion of said bore extending toward said remainder of said handle, said second portion of said bristle support carrying a plurality of bristles extending radially therefrom so as to extend toward opposed tooth surfaces when said support is between adjacent teeth, said second portion of said bristle support and bristles, in combination, having a conical cross-section, the exterior surfaces of said elongated handle in the vicinity of said first portion bristles being smooth, continuous and rounded whereby, in use, the user's gums will not confront a discontinuous surface.

4,387,480
ADJUSTABLE BRUSH
Roger Cobianco, 85 Suncrest Dr., Safety Harbor, Fla. 33572
Filed May 6, 1981, Ser. No. 260,978
Int. Cl.³ A46B 9/08
U.S. Cl. 15—169 **15 Claims**



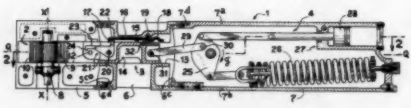
1. An adjustable brush, comprising:
a hollow cylindrical housing having a main channel coaxial with the cylindrical axis thereof and opening onto a working end of the housing;
a plurality of filamentary bristles slideably mounted in said channel of said housing for projecting a workpiece contacting end out from said working end of said housing;
a filament having a first end wrapped around said plurality of bristles within said channel and a second end extending axially along said channel and terminating outside said channel for grasping by the operator to produce a selective adjustment of the position of said bristles along said cylindrical axis;
whereby said contacting end of said bristles can be renewed by selectively adjusting said filament and cutting said bristles to the desired shape.

4,387,481
SOOT BLOWER
Gerald F. Zalewski, Albion, Pa., assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Feb. 17, 1981, Ser. No. 234,982
Int. Cl.³ F23J 3/02
U.S. Cl. 15—316 R **7 Claims**



1. In a soot blower of the long retracting type including a traveling carriage rotatably supporting a lance tube and movable along a path of travel between a forwardmost working position and a rearwardmost non-working position, means to impart traverse motion to said traveling carriage, which comprises
(a) a motor means,
(b) a rotatable drum-like element operatively asociated with said motor means,
(c) a first cable including one end fastened to said rotatable drum-like element,
(d) said first cable extending from said drum-like element around a pulley mounted at said rearwardmost non-working position to said traveling carriage,
(e) said first cable including a second end fastened to said traveling carriage,
(f) a second cable including an end fastened to said rotatable drum-like element,
(g) said second cable extending from said drum-like element around a pulley mounted at said forwardmost working position to said traveling carriage,
(h) said second cable including a second end fastened to said traveling carriage whereby said fastened ends of said first and second cables are fastened to said traveling carriage on opposite sides thereof.
(i) said rotatable drum-like element being positioned at a location adjacent said path of travel midway between said forwardmost working position and said rearwardmost non-working position,
(j) each of said first and second cables being wound through several complete turns about said rotatable drum-like element,
(k) said cables being arranged and configured whereby rotation of said drum-like element will take up one of said cables onto said element and unwind the other of said cables from said element,
(l) said cable being taken up by said element acting to pull said carriage,
(m) whereby each of said first and second cables is of the shortest practicable length relative to the distance between the forwardmost working position and the rearwardmost non-working position.

4,387,482
MODULAR SINGLE OR DOUBLE ACTION DOOR CLOSURE SYSTEM
Georges Maublanc, St. Germain du Plain, France, assignor to Pont-A-Mousson S.A., Nancy, France
Filed Nov. 10, 1980, Ser. No. 205,494
Claims priority, application France, Nov. 15, 1979, 79 28191
Int. Cl.³ E05F 3/00
U.S. Cl. 16—64 **8 Claims**



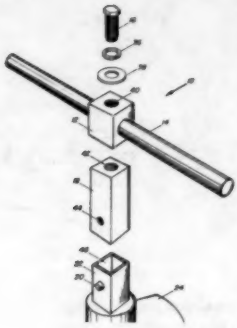
1. A modular door closure system comprising: a first motor assembly having a single action door-opening mechanism, a second motor assembly having a double action door-opening mechanism; a spring- and shock absorber-restoration drive assembly matable with both said first and second motor assemblies to form single action and double action door closures, respectively; a first elongated casing containing said first motor assembly and having a first coupling means; a second elongated casing containing said second motor assembly and having a second coupling means identical to said first coupling means; and a third elongated housing having a third coupling means matable with said first and second coupling means to form unitary single action and double action door closures, respectively; wherein the transverse dimensions of said first, second and third elongated casings are substantially the same.

4,387,483

EXTRACTING HANDLE FOR EARTH DRILL AUGERS

Edward M. Larrabee, 86 Snowden La., Princeton, N.J. 08540

Filed Jul. 11, 1980, Ser. No. 167,749
Int. Cl.³ A47B 95/02
U.S. Cl. 16—114 R 10 Claims



10. An extricating handle for dislodging an earth drill auger of the type having a shaft with a spiral screw-flight thereabout, said handle comprising:

handle grip means;

an auger shaft receiving means for selective connection to said auger shaft, said hand grip means being connectable to said auger shaft receiving means; and,

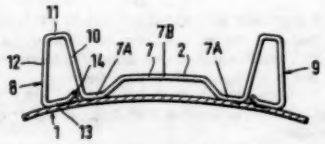
locking means for locking said auger shaft with respect to said auger shaft receiving means, said locking means including a spring-biased means for automatically locking said auger shaft to said auger shaft receiving means when said auger shaft receiving means is placed in locking position with respect to said auger shaft.

4,387,484

SUPPORTING BRACKET FOR SIDE HANDLES OF UTENSILS

Wolfgang Fischbach, Daaden, Fed. Rep. of Germany, assignor to Heinrich Baumgarten KG Eisen- und Blechwarenfabrik, Neunkirchen, Fed. Rep. of Germany

Filed Mar. 5, 1981, Ser. No. 240,709
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009766; Mar. 25, 1980, 8008180[U]
Int. Cl.³ A47J 45/10
U.S. Cl. 16—114 A 6 Claims



1. In a handle apparatus for a utensil, including a supporting bracket secured to a wall of said utensil and having a leg projecting away from said utensil, a handle having a recess therein for receiving said leg of said supporting bracket, and retaining means disposed in said handle recess and cooperable with said leg for releasably securing said handle on said utensil, the improvement comprising wherein said leg includes spaced first and second portions projecting outwardly from said utensil wall, a third portion extending between the outer ends of said first and second portions, and fourth and fifth portions respectively provided at the inner ends of said first and second portions and extending along and secured to said utensil wall, said first and second portions converging away from said utensil wall and said third portion being approximately parallel to said utensil wall, whereby said leg is of approximately trapezoidal shape, wherein said supporting bracket includes two said legs and a connecting web which extends therebetween so that said supporting bracket is generally U-shaped, each said fourth portion being a portion of said connecting web and each said fifth portion extending from the inner end of a respective said second portion toward the inner end of a respective said first portion, each said leg being received in said handle recess and said retaining means cooperating with each said leg.

4,387,485

METHOD OF EXTRACTING MEAT OF SMALL CRUSTACEANS

Efim N. Grinberg, ulitsa Bazhova, 13, korpus 2, kv. 119; Yakov I. Braginsky, ulitsa Moldagulovoi, 28, korpus 3, kv. 64; Yakov M. Zhislin, Fakultetsky pereulok, 4, kv. 19; Vladimir V. Lavrov, ulitsa Narodnogo Opolchenia, 23, korpus 1, kv. 63; Viktor A. Mitrofanov, bulvar Generala Karbysheva, 18, korpus 1, kv. 19; Nikolai A. Nikitushkin, ulitsa Volgina, 15, korpus 1, kv. 43; Alexandr A. Filatov, Yaroslavskoe shosse, 134, kv. 22; Jury F. Yaroshenko, Novo-Basmannaya ulitsa, 17, kv. 103; Samuil S. Torban, ulitsa Bolshaya Polyanka, 30, kv. 305; Viktor M. Kovalev, ulitsa Shipilovskaya, 41, korpus 1, kv. 140; Georgy I. Urusov, Preobrazhensky val, 24, kv. 135; Alla V. Rozanova, Amstradamskaya ulitsa, 9, stroenie 1, kv. 1; Tatyana N. Radakova, 1 Akademichesky proezd, 15, kv. 25; Larisa I. Krivosheina, Sevastopolsky prospekt, 83, korpus 1, kv. 47; Vladimir P. Bykov; Vladimira M. Bykova, both of Chertanovskaya ulitsa, 1a, korpus 1, kv. 84, and Igor V. Gultsev, ulitsa Malaya Schukinskaya, 15, kv. 78, all of Moscow, U.S.S.R.

Filed May 14, 1979, Ser. No. 38,792
Claims priority, application U.S.S.R., May 15, 1978, 2614820
Int. Cl.³ A22C 29/02
U.S. Cl. 17—48 4 Claims

1. A method of extracting meat of small crustaceans, comprising the following sequence of steps:

introducing the crustaceans into an air flow;

breaking up the shells of the crustaceans and separating the meat therefrom by making said air flow relative to the surface of said crustaceans at a predetermined velocity sufficient for creating a pressure differential between the internal cavity of said crustaceans and the said air flow.

4,387,486

CONTROL SYSTEM FOR FIBER PROCESSING APPARATUS

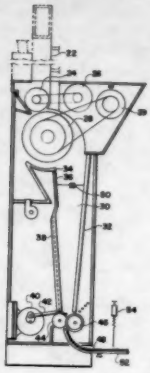
Alex J. Keller, Clover, S.C.; Joseph R. Williams, Kings Mountain, N.C.; Erhard A. Fechner, Gastonia, N.C., and Akiva Pinto, Gastonia, N.C., assignors to Automatic Material Handling, Inc., Bessemer City, N.C.

Continuation-in-part of Ser. No. 255,109, Apr. 17, 1981, abandoned. This application Jul. 16, 1981, Ser. No. 283,828
Int. Cl.³ D01H 5/38
U.S. Cl. 19—105 16 Claims

1. A control system for use in textile processing equipment that includes fiber feeding means for delivering a batt of fiber to carding means, said fiber feed means including an oscillating plate acting on the fiber in said fiber feeding means to densify said fiber, said control system comprising:

(a) signal generating means for sensing a function of the quantity of fiber in said batt delivered by said fiber feeding means to said carding means and for generating a signal that is proportional to said sensed quantity of fiber; and

(b) control means receiving said generated signal and varying the movement of said oscillating plate in said fiber feeding



means in a predetermined ratio to the quantity of fiber sensed by said signal generating means.

4,387,487

HIGH DRAFT APPARATUS IN SPINNING MACHINE

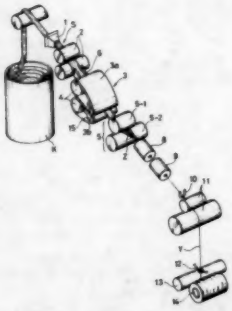
Teiji Nakahara, Ujishi; Toshifumi Morihashi, Ohtsushi; Teruo Nakayama, Ohtsushi; Shinichi Nishimura, Ohtsushi; Hisaaki Kato, Shigaken; Ikuzo Uematsu, Kyotoshi, and Takashi Yoshioka, Kyotofu, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Oct. 14, 1980, Ser. No. 196,480

Claims priority, application Japan, Oct. 16, 1979, 54-133979; Oct. 25, 1979, 54-138494

Int. Cl.³ D01H 5/88

U.S. Cl. 19—249 9 Claims



1. A high draft apparatus in a spinning machine comprising back rollers, a width adjusting guide, apron-provided middle rollers and front rollers which are arranged in succession along a yarn passage characterized in that the draft apparatus further includes a gripping and pressing means disposed on the front end of the apron which gripping and pressing means comprises a tenser bar having a T-shaped cross section which is fixed to a fixing bar and is disposed on the inner side of the front end of the lower apron, and a cradle which is urged toward the inner side of the front end of the upper apron by a spring and is urged in the pressed state toward the tenser bar.

4,387,488

FABRIC-COVERED BUTTON

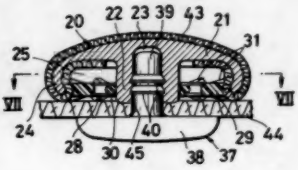
Yoshihiro Kanzaka, Nyuzen, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,608

Claims priority, application Japan, Mar. 26, 1980, 55-39973[U]

Int. Cl.³ A44B 1/12, 1/38

U.S. Cl. 24—113 R 13 Claims



1. A covered button for attachment to a piece of cloth having a preformed aperture, comprising:

(a) a button body including a domed head and a central boss projecting inwardly from said domed head and having a cylindrical outer surface and a cylindrical bore having a continuous circumferential wall and closed at its outer end, said domed head having an inwardly directed peripheral flange surrounding said central boss in spaced relation thereto;

(b) a retainer washer of synthetic resin adapted to be mounted on said boss resiliently with a force fit and having an outer periphery adapted to coact with said inwardly directed peripheral flange of the domed head in gripping between the outer peripheral edge of said washer and a radially inner surface of said flange an edge portion of a piece of fabric extending over said domed head and in around said peripheral flange; and

(c) a fastener having a base and a central shank projecting from said base and adapted to fit forcibly into said cylindrical bore in the central boss through an aperture in the piece of cloth to sandwich the piece of cloth between said base and said button body, one of said central shank and said boss having means for allowing air to escape from said bore when said shank is forced axially into said bore, said means comprising a passage extending axially between said shank and boss from the interior of said bore to the atmosphere.

4,387,489

CLASP FOR LOCKING A LIGATURE LOOP

Günter Dudek, Pulheim, Fed. Rep. of Germany, assignor to Prämeta Präzisionsmetaal-und Kunstofferzeugnisse G. Baumann & Co., Cologne, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,204

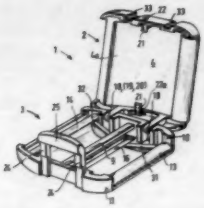
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104382

Int. Cl.³ F16G 11/00; A44B 11/06; A61B 17/08

U.S. Cl. 24—133 20 Claims

1. A clasp for gripping free end portions of a strap to maintain a loop thereof tightly engaged around an object such as a portion of the human body, said clasp comprising an upper casing half and a lower casing half and means for releasably securing said casing halves in superposed relation to each other to define a passage therebetween through which the free end portions of a strap may pass thereby forming a loop end at one end portion of a clamping lever, said clamping lever being pivotally carried by said clasp to present said one end portion lying at the loop end of said passage whereby to be forcibly engaged by the loop when tight so that the other end of said

clamping lever clamps the free end portions of the strap between it and one of the casing halves, said lower casing half



having a bridgelike cross bar lying transversely within said passage.

4,387,490

BUCKLES

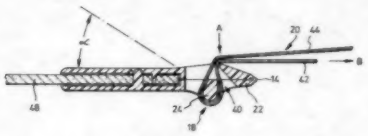
Neil P. Blackburn, Winchester; Alfred E. C. Piper, and Alan M. G. Meeks, both of Basingstoke, all of England, assignors to ITW Limited, Berkshire, England

Filed Jul. 14, 1981, Ser. No. 282,983

Claims priority, application United Kingdom, Jul. 15, 1980, 8023033

Int. Cl.³ A44B *11/02, 11/20*

U.S. Cl. 24—200 **4 Claims**



1. In combination with a workpiece, and a wrapable strap member, said strap member having a free-end portion, an improved buckle, said improved buckle being readily fixedly securable to said workpiece, said strap member being adjustably securable to said improved buckle, said improved buckle comprising: a one-piece plastic member, said one-piece member including a first flap and a second flap integral through a resilient hinge with said first flap; said first and second flaps including means for clinching said workpiece engaged therebetween, said workpiece-clinching means being in distal relation to said hinge, for readily fixedly securing said buckle to said workpiece; said first and second flaps including bar means having a first bar and a second bar for adjustably securing said strap member to said buckle, said bar means being proximate to said hinge in relation to said workpiece-clinching means, said strap member extending in one direction from said buckle and said free-end portion being wrapable around said first bar and then directable back in said one direction between said second bar and the remainder of said strap member for causing said free-end portion of said strap member engaging said second bar to be secured to said buckle and for pulling said flaps around said hinge and against said workpiece engaged therebetween, said buckle when fixedly secured to said workpiece being rotatable about the axis of said first bar for disengaging said strap member from said second bar thereby permitting adjustment of said strap member secured to said buckle.

4,387,491

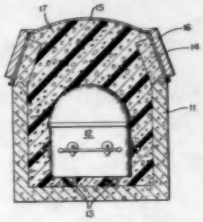
BURIAL ENCLOSURE ARRANGEMENT AND METHOD

Cecil F. Schaaf; Craig R. Schaaf, both of 3015 Palmer Rd., Standish, Mich. 48658; James E. Van Linden, and Kirk S. Van Linden, both of 3384 Michelle Ct., Clio, Mich. 48420

Continuation-in-part of Ser. No. 133,345, Mar. 24, 1980, abandoned. This application Jul. 30, 1981, Ser. No. 288,630

Int. Cl.³ A61G *17/00*

U.S. Cl. 27—35 **3 Claims**



1. An improved method for protectively sealing and enclosing a substantially closed container within an initially open-topped outer receptacle having sides which extend above the top of the enclosed container to prevent leakage of the contents of the container to the exterior of the receptacle or infiltration of outside elements into the container, comprising the steps of:

supporting the substantially closed container within the receptacle so that substantially all of the lower surface of the container is spaced from the bottom of the receptacle and so that the container is laterally spaced from the side enclosing walls of the receptacle;

partially filling the open-topped receptacle with a foamable plastic material in liquid form, the volume of liquid being insufficient to cause floatation of the container within the receptacle unit but sufficient so that the resulting foam will contact the lower portion of the container and anchor it to the interior of the receptacle as a result of the bond which is formed at the foam-to-receptacle and foam-to-container interfaces;

after the first foaming has at least substantially set, applying at least one additional pouring of foamable plastic material in liquid form to the interior of the still-open-topped receptacle, the volume of said additional application being sufficient so that the resulting foam will completely cover and enclose the container, thereby eliminating all air space immediately adjacent the exterior of the substantially closed container.

4,387,492

PLATED JACKET SOFT POINT BULLET

Darrel F. Inman, Lewiston, Id., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Oct. 2, 1980, Ser. No. 193,093

Int. Cl.³ B21K *21/06*

U.S. Cl. 29—1.23 **6 Claims**

1. A method for manufacturing a plated soft nose bullet comprising the steps of

providing a selected quantity of a deformable first metal capable of being electroplated,

forming said first metal into a core generally of the size and shape of the desired finished bullet, said core having opposed forward and rear ends,

electroplating said core with a second metal to a pre-selected thickness,

removing the electroplated second metal from the forward end of said core to expose a portion of said first metal, and

forming said plated core to its desired final shape and size in such a manner that a quantity of unplated first metal is extruded forwardly from remaining plated portions to form an unplated forward portion for said bullet.

4,387,493

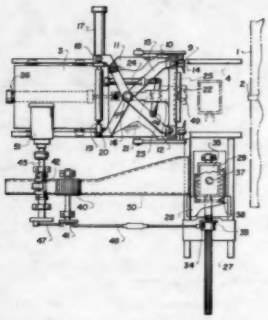
BINDING BAND CUTTING APPARATUS

Tamio Nakaie, 3-11-1 Uenomaru, Akashi-shi, Hyogo-ken, Japan

Filed Nov. 24, 1980, Ser. No. 209,827

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—56.5 **4 Claims**



1. An apparatus for cutting the binding band on a strip coil which comprises a carriage movable towards and away from said strip coil in parallel to the strip axis of the strip coil when the strip coil is carried to said apparatus, a substantially T-shaped pawl guide rod operatively connected to the leading end of said carriage for movement towards and away from said strip coil and having a transverse pawl guide groove in the front face of the transverse portion of said T-shaped pawl guide rod, a substantially X-shaped jaw member including a pair of plates intersecting each other and pivoted in the centers of the plates to each other and at the leading ends to the opposite ends of said transverse portion of the T-shaped pawl guide rod, a pair of pawls each having a pointed leading end bent inwardly and secured to said leading ends of the plates of the jaw member to be slidably guided along said pawl guide groove in the T-shaped pawl guide rod, a first cylinder operatively connected to said pawl guide rod for operating the guide rod, a second cylinder operatively connected to the rear end of said jaw member for operating the jaw member, a pair of substantially L-shaped probe rods journalled on the opposite sides of said carriage with the longer legs of said probe rods extending towards each other, a primary cutting blade secured to the undersurface of said transverse portion of the T-shaped pawl guide rod, a rubber pad secured to said cutting blade substantially in the center of the blade, a second carriage provided adjacent to said transverse portion of the T-shaped pawl guide rod for slidable movement towards and away from said strip coil at right angles to the axis of said first-mentioned carriage, a lower feed roller rotatably mounted in a lower portion of said second carriage, a splined shaft journalled in said second carriage for rotatably supporting said lower feed roller, an upper feed roller positioned above said lower feed roller for movement towards and away from said lower feed roller, a third cylinder for operating said upper feed roller, feed rollers for shredding positioned rearwardly from said lower feed roller, and shredding blade means positioned rearwardly from said feed rollers for shredding and mounted for upward and downward movement by means of a crank mechanism, whereby said shredding blade means cooperate with said feed rollers for shredding, in further cutting said binding band into pieces after the binding band has been pulled from the strip coil by the pawls and primarily sheared off by said primary cutting blade and then pulled to the shredding blade means by said feed rollers on said second carriage for delivery to the feed rollers for shredding and in turn to the shredding blade means.

4,387,494

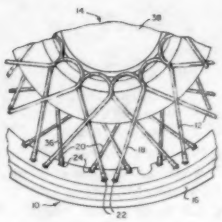
METHOD FOR MANUFACTURING A SIMULATED WIRE WHEEL COVER

Don W. McClure, Sterling Heights, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 26, 1981, Ser. No. 267,167

Int. Cl.³ B21D *53/26*

U.S. Cl. 29—159 A **6 Claims**



1. A method of assembling a wire wheel cover comprising: inserting a rim member in a fixture; inserting a hub member centered within said rim member, said hub member having a truncated conical camming surface thereon; positioning a row of spokes between said rim member and said hub member, said row of spokes comprising a plurality of generally V-shaped wire members, said generally V-shaped members are capable of engaging said hub member with the apex of each of said generally V-shaped simulated wire members bearing upon said truncated conical camming surface on said hub; moving generally V-shaped simulated wire members along said conical camming surface and thereby driving the ends of said simulated wire members radially outwardly into positive engagement with said rim member; welding said generally V-shaped wire members to form an integral array of spokes; and fastening said hub member to said integral array of spokes.

4,387,495

METHOD AND APPARATUS FOR FEEDING CONDUCTIVE WIRE FOR ANODIZING PROCESS OF SLIDE FASTENER CHAIN

Koitsu Morioka, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jul. 24, 1981, Ser. No. 286,476

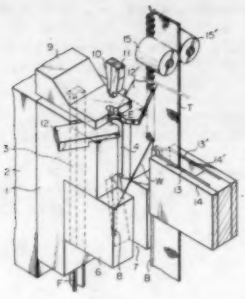
Claims priority, application Japan, Sep. 25, 1980, 55-133477

Int. Cl.³ B21F *45/18*; A41H *37/06*

U.S. Cl. 29—408 **6 Claims**

1. A method of feeding a conductive wire for anodizing process of a slide fastener chain in a system in which the wire is mounted on the beaded portion of the fastener tape by fastener elements successively fixed to the beaded portion, the method comprising: providing a wire guide member movable perpendicularly to the feeding movement of the fastener tape; passing the conductive wire through said guide member so that it is guided by the wire guide member before it is secured to said beaded portion of the tape; reciprocating said guide member between a first position in which the wire portion adjacent the lastly secured elements is in contact with the beaded portion of the tape and extends parallel with the feeding direction

of the tape and a second position in which said wire portion angularly extends away from the beaded portion; and fixing a



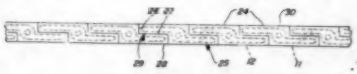
fastener element together with the wire to said beaded portion and feeding the tape thereafter when said wire guide member is in its first position.

4,387,496

METHOD OF FORMING A SPRAY ARM

Raymond W. Spiegel, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 8, 1980, Ser. No. 214,018
Int. Cl.³ B23P *11/00, 17/00;* **B21D** *39/02*
U.S. Cl. 29—416 **5 Claims**



1. The method of forming a hollow dishwasher spray arm having a top wall defining a first formed configuration and a bottom wall defining a second, substantially different formed configuration, comprising the steps of:

providing a strip of sheet material from which the spray arm is to be formed;

dividing the strip successively at longitudinally spaced portions to define a series of blanks, each blank having a central portion extending the full width of the strip and oppositely extending end portions, one end portion extending from one side of the strip substantially one-half the width of the strip and the other end portion extending from the opposite side of the strip substantially one-half the width of the strip, the substantially different configurations of the spray arm top and bottom walls and the configuration of said blanks from which they are to be formed being coordinated such that each of said blanks is identical and suitable for use in forming either of said spray arm top or bottom walls with effectively minimized wastage;

forming said top wall from one of said blanks;

forming said substantially different bottom wall from the other of said blanks; and

securing the top and bottom walls edgewise to form the hollow spray arm.

4,387,497

CAPTIVE SCREW ASSEMBLY METHOD AND PRODUCT

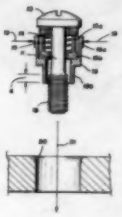
Bulent Gulistan, 3944 Bon Homme Rd., Woodland Hills, Calif. 91364

Filed Nov. 7, 1980, Ser. No. 204,823
Int. Cl.³ B23P *11/00, 19/02*
U.S. Cl. 29—511 **4 Claims**

1. A method of providing a captive screw assembly including the sequential steps of:

(a) inserting a cylindrical bushing over the shank of a screw member prior to forming threads on the shank and positioning one end of the bushing next to the underside of the screw head so that the maximum length of the screw shank is exposed from the opposite end of the bushing;

(b) forming threads on the screw shank over a given exposed length of the shank, the inside diameter of said bushing being less than the outside diameter of the formed screw threads, so as to be held captive on the screw shank; and



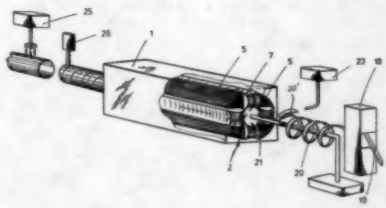
(c) inwardly deforming an outer sleeve onto said bushing, said outer sleeve having means spaced axially beyond said opposite end of said bushing for securing the bushing to a panel opening whereby the threads can be formed of sufficient length to assure continuous threaded engagement with a member to be fastened to the panel by the captive screw.

4,387,498

METHOD FOR MAKING HELICALLY WOUND SURFACE-COATED TUBES, AND APPARATUS FOR CARRYING OUT THIS METHOD

Alfred Morhard, Königsberger Str. 24, 7272 Altensteig-Walddf., Fed. Rep. of Germany

Filed Mar. 20, 1980, Ser. No. 132,363
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1979, 2912308
Int. Cl.³ B22D *11/126*
U.S. Cl. 29—527.2 **4 Claims**



1. A method of making a multi-layer tube, comprising the steps of preheating two elongate, flat metal strips; bending each said preheated metal strip to a substantially arcuate curvature; winding each said curved metal strip in a helical configuration with the edges of adjacent windings butting against each other, one said strip being closely concentrically wound around and axially offset with respect to the other said strip, whereby said metal strips define a generally cylindrical metal tube; applying a first synthetic resin between said metal strips as said strips are wound into said concentric relationship, thereby effecting a continuous and concentric layer of resin intermediate said strips; applying a continuous coating of second synthetic resin to the radially inner surface of said tube during said winding step; pre-curing said intermediate layer and said inner coating thereafter applying a continuous coating of a third synthetic resin to the radially outer surface of said

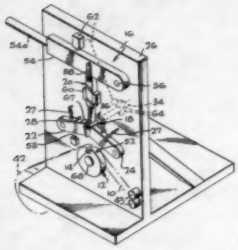
tube; and curing fully said intermediate layer, inner coating and outer coating.

4,387,499

LEADER TO HUB LOCKING SYSTEM

Vern R. Schwartz, and Bernard D. Benz, both of Sunnyvale, Calif., assignors to Verbatim Corporation, Sunnyvale, Calif.

Filed Feb. 3, 1977, Ser. No. 765,130
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—564.6 **9 Claims**



4. Apparatus for installing a tape leader on a hub that has an undercut slot, comprising:

means for holding the tape leader over the hub slot;

a pair of compressing means for pressing on opposite sides of a resilient locking member to establish it at a reduced width at a location adjacent to said hub slot but on a side of said tape leader which is opposite said slot; and

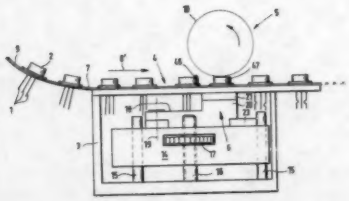
means for pressing said resilient member from between said pair of compressing means and against the tape leader into said slot.

4,387,500

APPARATUS FOR OPERATING UPON CONNECTING WIRES OF ELECTRIC COMPONENTS

Thomas Weresch, Greschbachstr. 19, D-7500 Karlsruhe 41, Fed. Rep. of Germany

Filed Sep. 17, 1980, Ser. No. 187,995
Int. Cl.³ B23P *23/00*; B21F *45/00*
U.S. Cl. 29—566.3 **30 Claims**



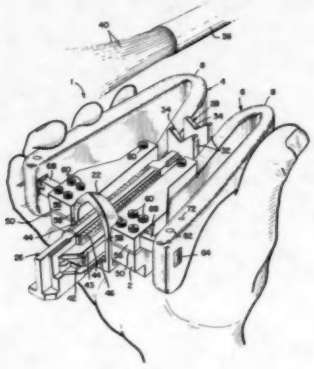
1. An apparatus for preparing leads of electrical components, having connecting leads extending parallel to one another and only in one direction, with the apparatus having a conveying device adapted to supply the components, the conveying device being a non-moving component guide comprising a sliding guide with a guide slot, through which the connecting leads extend to project downwardly, and having a cutting device for cutting the connecting leads to length, said apparatus further comprising at least one tool set having two tools which are cooperable for shaping the connecting leads between them by bending and kinking, the tool set being disposed beneath the guide slot, at least one of the tools being operable to move against the other by a closing movement in a direction which is perpendicular to the guide slot, and both of the tools being jointly movable parallel to one another, within an operating range, in an operating movement, said closing movement of the tool set being synchronized with said operating movement in such a manner that the tools are closed during a part of the operating movement which takes place in a direction in which the components are conveyed and are opened in a direction opposite to the conveying direction.

4,387,501

PALM GRIP APPARATUS FOR INSERTION OF WIRES

Robert D. Rix, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 24, 1980, Ser. No. 209,566
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—566.4 **5 Claims**



1. An apparatus for cutting and inserting a pair of wires into electrical terminals of an electrical connector, and for indexing the connector, the improvement comprising:

a body,

a carriage movable with respect to said body,

a cusp mounted on said body and defining wire receiving slots on either side thereof,

a pair of wire insertion and cutting rams mounted for reciprocation in said body, toward and away from opposite sides of said carriage,

resilient levers connected to said body and doubled back on themselves and pivotally connected to said rams,

a feed pawl engaged on said carriage and pivotally secured on an arm, in turn, reciprocably mounted on said body and secured to one of said levers, and

a locking pawl reciprocably mounted on said body for releasable engagement on said carriage.

4,387,502

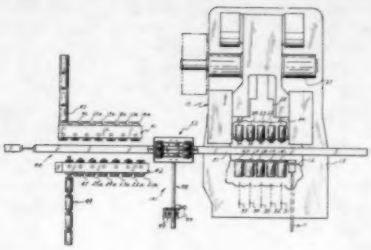
SEMI-AUTOMATIC TOOL CHANGER

Harry A. Dom, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Filed Apr. 6, 1981, Ser. No. 251,352
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **6 Claims**

1. A tool changer for forging machines or the like comprising a machine providing tools at a plurality of spaced work stations, a tool supply adjacent to said machine providing replacement tools at a plurality of spaced storage stations, said tool changer providing a horizontally movable carriage movable on support means between said machine and said supply, a power lift supported by said carriage for movement therewith, a tool handling head supported by said lift for vertical movement thereby, a plurality of locater means positioned to be associated with said work and storage stations providing an

indication when said carriage is positioned over each of said work stations and each of said storage stations for positioning said tool changer at each station, first and second cam means operable to position said head with respect to said stations as



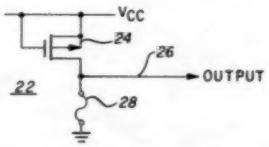
said head is lowered by said lift, said first cam means operating first to ensure relatively close positioning of said head, and said second cam means operating to thereafter provide final positioning of said head.

4,387,503

METHOD FOR PROGRAMMING CIRCUIT ELEMENTS IN INTEGRATED CIRCUITS

Cecil J. Aswell, Coppell, and Hugh N. Chapman, Lewisville, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Aug. 13, 1981, Ser. No. 292,512
Int. Cl.³ H01L *21/268, 21/322*
U.S. Cl. 29—575 **7 Claims**



1. A method for programming a logic switch in an integrated circuit, comprising the steps of:

directing an energy beam to open a link fabricated in said integrated circuit thereby disconnecting an output node from a first power terminal; and

directing an energy beam toward a transistor fabricated in said integrated circuit, where said transistor is connected between said output node and a second power terminal and is normally turned off, to damage the structure of said transistor and produce therefrom a conducting path between said output node and said second power terminal.

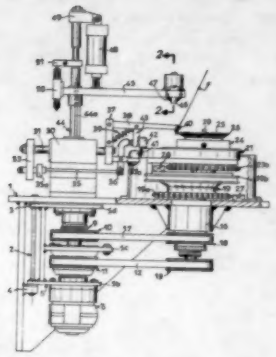
4,387,504

MACHINE FOR FLATS OR CONICAL WINDINGS IN THE FORM OF A DISC FOR ELECTRIC MOTORS

Michel Coquillart, Saint Etienne Terrenoire, France, assignor to Mavilor Systemes, Switzerland

Filed Nov. 21, 1980, Ser. No. 209,293
Claims priority, application France, Dec. 5, 1979, 79 30267
Int. Cl.³ B21F *3/00*
U.S. Cl. 29—598 **33 Claims**

1. In a machine for making dynamo-electric windings, having a rotatable coil holder (24) and wire distributing means radially displaceable relative to the coil holder for continuous formation of winding coils from wire (F) fed thereto, the improvement comprising rotatable cam means (20-21-41-42) engageable with the wire distributing means for said displacement thereof, a drive motor (6), transmission means (10-11-12-13-17-18-22-23*a*) drivingly connecting the motor to the cam means and the coil holder for rotation thereof, and clutch-brake control means (7-9) operatively connected to the transmission means for alternatively imparting said rotation to both the cam means and the coil holder or to the coil holder alone,



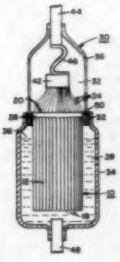
to adjustably form the winding coils (S) in offset trapezoidal sections extending in conical relation to radially inner dead turns (S3) about a winding center.

4,387,505

METHOD OF FORMING A BATTERY CELL

George C. Shay, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 167,423, Jul. 11, 1980, Pat. No. 4,310,607.
This application Aug. 17, 1981, Ser. No. 293,612
Int. Cl.³ H01M *10/38*
U.S. Cl. 29—623.1 **5 Claims**



1. A method of making a battery cell having a first oxidizable liquid metal electrode, a second fluid reducible electrode and a substantially fluid tight electrolyte/separator separating said first and second electrodes wherein said electrolyte/separator is in the form of a plurality of hollow fibers which comprises, forming a plurality of a longitudinally extending hollow fibers having open ends, sealing off one end of each of said hollow fibers, forming a bundle of said hollow fibers by juxtapositioning a plurality of said hollow fibers in substantially parallel relationship with longitudinally extending outer surface portions of adjacent hollow fibers contacting one another and with said sealed ends of said hollow fibers being positioned at one end of said bundle and opposite open ends of said fibers being positioned at the opposite end of said bundle, sealing wall portions of adjacent fibers forming said separator bundle together adjacent the open ends of said fibers and forming a solid sealing mass of the same composition as said fibers and thus closing off interstices between said fibers adjacent their open ends, sealing at least a portion of the contacting longitudinally extending outer surface portions of adjacent hollow fibers together at locations spaced apart from said solid sealing mass

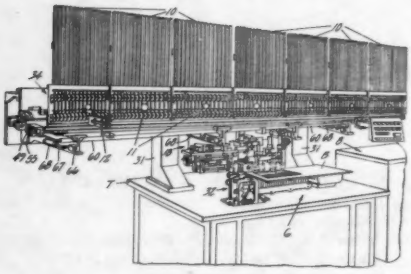
to form a substantially rigid separator bundle with interstices formed between adjacent fibers along their outer longitudinal surfaces, positioning current collecting means within said fibers so as to extend outwardly therefrom through said open ends, and sealing said separator bundle within a battery cell housing with said solid sealing mass positioned substantially at an interface between said first and second electrodes.

4,387,506

COMPONENT INSERTING MACHINE

Henry L. Wright, Ipswich; Vitaly Bandura, Danvers, and Daniel W. Woodman, Jr., Beverly, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Jun. 9, 1981, Ser. No. 271,836
Int. Cl.³ H05K *3/30*
U.S. Cl. 29—714 **11 Claims**



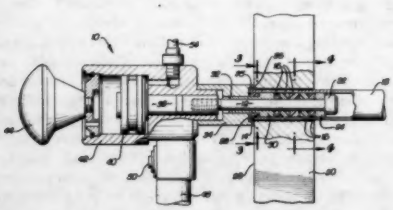
1. In a machine for applying to circuit boards components selected individually from magazines and having picker means movable in a predetermined sequence between selected magazines and a component conditioning means, the improvement in which the picker means includes at least two pickers movable along opposite sides of a path in which the magazines are arranged, each picker having a receptacle movable between a retracted position to an advanced position for receiving a component selected from a predetermined magazine, the pickers being arranged to pass without interference during movement between the conditioning means and the magazines when at least one of said receptacles is in retracted position.

4,387,507

METHOD AND APPARATUS FOR RADIALLY EXPANDING TUBES

John W. Kelly, Burbank, Calif., assignor to Haskel Engineering & Supply Co., Burbank, Calif.

Filed Apr. 20, 1981, Ser. No. 255,789
Int. Cl.³ B23P *15/26, 17/00, 11/02*; B21D *39/20*
U.S. Cl. 29—727 **14 Claims**



11. An apparatus for anchoring a tube within a tube sheet in preparation for a subsequent swaging operation, said apparatus comprising:

an anvil adapted to engage a surface of said tube sheet and thereby position said apparatus;

a hydraulic cylinder connected to said anvil and immovable with respect thereto;

a piston movable within said cylinder;

a draw bar connected to said piston for movement therewith and adapted to be inserted in said tube;

a sleeve in which said draw bar is slidable;

a primary expander encircling said sleeve and adapted to be positioned within said tube adjacent to said tube sheet surface;

a segmented secondary expander encircling said draw bar, said secondary expander having a larger cross section than said primary expander when considered with respect to a plane passing transversely through said tube; and

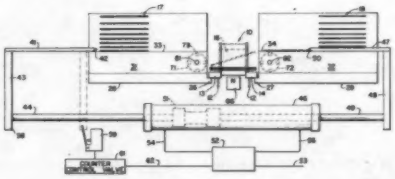
a head carried by said draw bar to compress said expanders radially and thereby expand said expanders radially upon axial movement of said draw bar.

4,387,508

APPARATUS FOR MAGNETICALLY ASSEMBLING FRAGILE PARTS

Kenneth L. Wyatt, Oklahoma City, Okla., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 26, 1981, Ser. No. 238,315
Int. Cl.³ H01F *41/02*
U.S. Cl. 29—738 **5 Claims**



1. A machine for assembling magnetically soft laminates into an opening formed in a frame, which comprises:

a bin having a pair of walls for receiving a stack of magnetically soft laminates;

planar magnetic means positioned adjacent to the outer sides of said walls for establishing a magnetic field extending into said bin to magnetize the edge sections of said laminates, said magnetic means having facing surfaces magnetized with opposite polarities to induce magnetizing forces in adjacent edge sections of like polarity that act as repelling forces to separate said laminates;

means for supporting a frame with a top portion of the opening therein extending toward the lowermost laminate in said bin;

a pickup device for cyclically engaging and advancing the lowermost laminate from said bin into the top portion of the opening in the supported frame whereafter the laminate drops and seats in the frame opening;

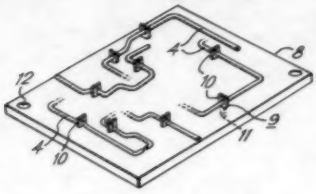
magnets positioned adjacent to the lower portion of the supported frame for assisting the seating of the laminate in the opening and for holding the laminate in the position during the seating of subsequent laminates; and

magnetic means for vibrating each advanced laminate relative to the opening to impart a slight twist to the leading edges of the laminate whereupon the leading edge seeks out the opening and then advances into the opening in the frame.

4,387,509
METHOD OF MANUFACTURING AN ELECTRICAL INTERCONNECTION ASSEMBLY

Helen Dechelette, St. Cloud, France, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 17, 1981, Ser. No. 293,561
Int. Cl.³ H01K 3/10
U.S. Cl. 29—850 10 Claims



1. A method of manufacturing an electrical interconnection assembly comprising a plurality of electrical terminals carried by a common electrically insulating support and interconnected in a predetermined arrangement by electrical conductors, the method including the steps of laying a continuous length of insulated electrical wire in a groove formed in a template; cutting the length of wire in the groove into a plurality of pieces; and urging the pieces of wire from the groove on to an insulating support carrying a plurality of electrical terminals each having a slotted plate portion providing an insulation displacement slot which receives a piece of wire and establishes an electrical connection thereto whereby the terminals become interconnected by the pieces of wire in the predetermined arrangement.

4,387,510
GARDEN CUTTING TOOL

Mirahmad Hashemifard, 3 Robin Hill Rd., Great Neck, N.Y. 11024

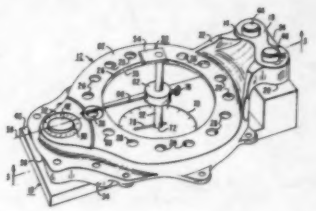
Filed Oct. 30, 1981, Ser. No. 316,773
Int. Cl.³ B26B 3/00
U.S. Cl. 30—314 6 Claims

1. A garden cutting tool which comprises:
(a) a blade;
(b) a neck having an arm affixed to bottom of said blade, a sleeve having a central aperture, extending from said arm and a pair of rods diametrically extending vertically from bottom of said sleeve;
(c) a handle having an extension that mates within said central aperture of said sleeve, said handle having a pair of apertures diametrically extending vertically at base of said extension, whereby said rods go into said apertures and are bent at bottom of said handle to keep said handle in a secure and stable position; and
(d) a fastener placed horizontally through said sleeve of said neck and said extension of said handle to keep said handle in a secure and stable position.

4,387,511
CAM MASTER SPIDER IDENTIFIER

Jon H. Wong, Sterling Heights, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 26, 1981, Ser. No. 277,517
Int. Cl.³ G01B 3/00
U.S. Cl. 33—1 BB 11 Claims



1. An apparatus for identifying automotive brake spiders of the type having two anchor pin holes which extend between a first and second side of a boss on said spider said anchor pin holes at a first end of said spider and capable of said spider capable of receiving an automotive axle spindle therethrough, a plurality of mounting holes in a circular pattern around said spindle hole extending from a first to a second side of said spider, said first side of said spider capable of engaging a mounting flange on said spindle, a single actuator rod hole located at the end of said spider opposite said first end, said boss offset from said first side of said spider, said spider having an axis running through the centers of said actuating rod hole and said spindle hole and perpendicularly bisecting a line in between the centers of said anchor pin holes, said apparatus comprising: means for supporting and positioning said brake spider; depth gauge means, removably mounted on said supporting and positioning means, capable of measuring the offset between said anchor pin boss and said first side of said brake spider and means capable of measuring the angular offset of a predetermined mounting hole from said axis, said angular offset measured from a center located at said center of said spindle hole, said means for measuring said angular offset being rotatably mounted on said supporting and positioning means.

4,387,512
PASTA GAUGE AND CONTAINER

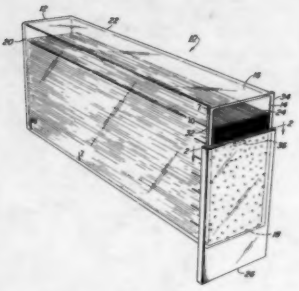
Carol A. Gorski, and Saul B. Gorski, both of 123 S. Blanchard St., Wheaton, Ill. 60187

Continuation-in-part of Ser. No. 32,509, Apr. 23, 1979, Pat. No. 4,334,361. This application Dec. 8, 1980, Ser. No. 214,036
Int. Cl.³ G01B 5/00; B65D 5/72
U.S. Cl. 33—174 T 4 Claims

1. A pasta gauge and container for holding a supply of elongated, dried pasta members and for removing selected, predetermined amounts of said pasta members therefrom comprising
an elongated box having top and bottom mutually parallel, planar walls, a pair of mutually parallel, planar side walls, and an end wall affixed to said walls at one end of said box, the other ends of said walls providing a rectangular opening at the other end of said box,
a generally planar cover and gauge member slidably mounted to said box over said rectangular opening for movement between a closed position completely covering

said opening and a plurality of other positions only partially covering said opening,

said cover when in said other positions defining with said side walls and one of said top and bottom walls a rectangular opening through which a selected amount of said pasta members may be poured out of said box, and



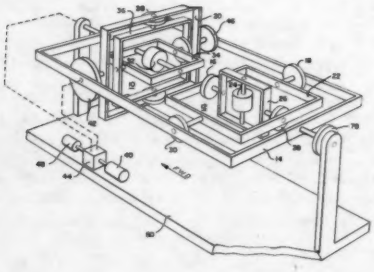
indicia provided on at least one of said sidewalls in proximity to said other end for providing a visible indication of the amount of pasta members selected by the position of said cover.

4,387,513

AIRCRAFT BODY-AXIS ROTATION MEASUREMENT SYSTEM

Kenneth T. Cowdin, Lancaster, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 11, 1981, Ser. No. 242,790
Int. Cl.³ G01C *19/44*
U.S. Cl. 33—322 **9 Claims**



1. A displacement gyroscope system for indicating the orientation of a body in space, said body having orthogonal longitudinal, lateral and vertical axes, comprising:

an outer roll gimbal mounted to said body for rotation about an outer roll axis substantially parallel to said longitudinal axis;

first means for providing an indication that the magnitude of the first angular displacement of the longitudinal axis from the horizontal earth plane is equal to or greater than a threshold value;

second means, responsive to said first means, for maintaining said outer roll gimbal substantially stationary with respect to a first plane defined by said longitudinal and said lateral axes; and

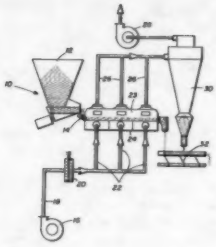
third means for providing a first signal indicative of the angular displacement of said longitudinal axis about said vertical axis when the magnitude of said first angular displacement is less than said threshold value and indicative of the angular displacement of said vertical axis about said longitudinal axis when the magnitude of said first angular displacement is equal to or greater than said threshold value.

4,387,514

METHOD FOR DRYING OIL WELL DRILL CUTTINGS

James N. McCaskill, Jr., Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 6, 1981, Ser. No. 251,437
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—31 **6 Claims**



1. A method for drying oil well drill cuttings to eliminate pollution causing volatile organic material including hyrocarbons from the cuttings comprising the steps of:

conveying the drill cuttings bearing the organic material to a heat transfer zone;

pre-heating large quantities of relatively warm combustion supporting gas acting as a heat transfer medium to a temperature less than the ignition point of said hydrocarbons;

supplying large quantities of the relatively warm gas to the heat transfer zone to form a diluted gas-organic material mixture to prevent the formation of a combustible mixture; and

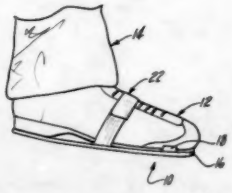
directly mixing the gas with the drill cuttings to rapidly vaporize water and pollution causing volatile organic material from the drill cuttings and subsequently increase the temperature of the cuttings.

4,387,515

BOWLING SHOE PROTECTOR

Darwin E. Baldwin, 9721 Andersonville Rd., Clarkston, Mich. 48016

Filed Oct. 22, 1980, Ser. No. 199,480
Int. Cl.³ A43B *3/10, 5/00*
U.S. Cl. 36—7.5 **10 Claims**



1. A bowling shoe protector consisting of:

a substantially flat support sole having a peripheral configuration which generally conforms to the lower surface profile of a bowling shoe;

a single strap secured at its center laterally across the sole at substantially the longitudinal center of the sole;

first means for securing the ends of the strap to each other, whereby securing the ends forms a loop into which a shoe can be inserted;

second means for entraining the shoe within the peripheral edges of at least a portion of the sole;

wherein said single strap is the sole means for securing the protector to the shoe;

whereby the bowling shoe protector is freely slidable over said shoe so that the shoe becomes engaged within said loop to secure said protector to said shoe; and

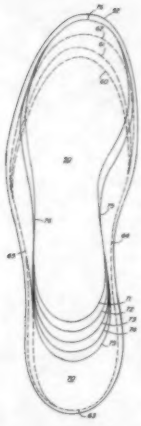
whereby the protector is easily removed by being freely slidable over said shoe to disengage said shoe from said loop.

4,387,516

UNIVERSAL INSOLE

Joseph J. Laux, Scottsdale, Ariz., assignor to L & A, Inc., Phoenix, Ariz.

Filed Dec. 22, 1980, Ser. No. 218,532
Int. Cl.³ A43B *13/38*
U.S. Cl. 36—43 **4 Claims**



1. A universally sized insert for footwear comprising:

(a) an insole having the general shape of a human foot having opposite surfaces, a heel portion, a toe porton and opposite lateral and medial sides;

(b) a first set of pattern markings on one of said surfaces representing a plurality of foot sizes, each of said first set of pattern markings being in the general configuration of a human foot, said first set of markings having a common toe portion and being displaced on said insole toward the toe portion of said insole and having a plurality of generally arcuate sections in the heel area representing different sizes;

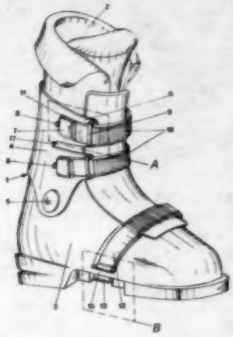
(c) a second set of contrasting markings on the said one of said surfaces representing a plurality of foot sizes, each of said second set of markings being in the general configuration of a human foot, and second set of markings having a common heel portion and being displaced on said insole toward the heel of said insole and having a plurality of generally arcuate sections in the toe portion all representing the different shoe sizes thereby permitting the user to trim the insert to the desired size by trimming at a preselected marking.

4,387,517

SKI BOOT WITH REMOVABLE FASTENING STRAPS

Giuseppe Annovi, Montebelluna, Italy, assignor to Dolomite S.p.A., Treviso, Italy

Filed Feb. 11, 1981, Ser. No. 233,562
Claims priority, application Italy, Feb. 21, 1980, 61913/80[U]
Int. Cl.³ A43B *5/04, 11/00*; A43C *11/00*
U.S. Cl. 36—117 **4 Claims**



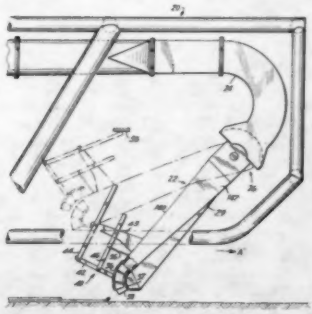
1. A ski boot formed of plastics material and including an upper having flaps, one flap of the upper having integral mushroom-like projecting elements formed of the same plastics material from which the upper is made by injection molding, closing straps for the upper adapted to be tightened by pulling levers fixed on the flap remote from the projecting elements, a ring on the end of each of said straps adapted to interlock with one of said projecting elements, and stems rising from said one flap and spaced from the margin of said projecting elements by a distance slightly less than the thickness of said ring, whereby when the straps are broken they may be easily replaced by new straps.

4,387,518

SEPARABLE LIQUID FLOW SCREENING MEANS FOR EXCLUDING OVERSIZED, SLENDER OBJECTS CARRIED BY A LIQUID, AND DREDGE MEANS INCLUDING SAME

John P. Latimer, Newport News, Va., assignor to Deepsea Ventures, Inc., Gloucester Point, Va.

Continuation-in-part of Ser. No. 232,835, Feb. 9, 1981, Pat. No. 4,347,765. This application Jun. 8, 1981, Ser. No. 271,550
Int. Cl.³ E02F *3/94*; B07B *1/16, 1/28*; B01D *35/12*
U.S. Cl. 37—57 **16 Claims**



1. Screening means for preventing the passage of long slen-

der objects carried by liquid flowing through a conduit, said screening means comprises:

(1) a conduit for liquid flow having a longitudinal axis extending along the conduit, and having a first wall, a portion of which is movable to open the conduit;

(2) a plurality of adjacent, complementary corrugated plates, movably secured within the conduit, and located adjacent the movable portion of the first wall, the opposed major surfaces of each adjacent pair of plates defining a serpentine, restricted flow passage therebetween, the axes of the corrugations of the plates being substantially mutually parallel and extending in a direction perpendicular to the longitudinal axis of the conduit;

(3) means for remotely opening the movable wall portion of the conduit, the movable conduit wall portion extending parallel to the axes of curvature of the plates; and

(4) means for remotely moving at least some of the plurality of corrugated plates as a group to outside of the conduit through the opening defined by the movable wall portion and in a direction transverse to the longitudinal axis of the conduit and transverse to the axes of the corrugations while at least instantaneously increasing the distance separating the corrugated surfaces of the adjacent plates when the plates are outside of the conduit, and for returning the corrugated plates to their positions within the conduit.

13. In a dredge means for collecting particles from the floor of the ocean, the particles entering the dredge means together with a large volume of water, the dredge means comprising: a nozzle having a nozzle inlet designed to be located adjacent to the ocean floor; liquid pumping means for drawing a flow of liquid with suspended solids into and through the nozzle inlet; and conduit having a longitudinal axis extending along the conduit, the nozzle and conduit defining an internal flow channel between the nozzle opening and the pumping means; the improvement comprising, a first side of the conduit, a portion of which is movable to open the conduit, screening means suitable for excluding long slender objects from passing through the flow channel, the screening means comprising a plurality of adjacent plates having corrugated surfaces, the plates being movably secured to the conduit such that in a first position within the flow channel the corrugated opposed surfaces of adjacent plates define curved, restricted flow passages within the conduit, the axes of the curves of which extend transversely to the longitudinal axis of the flow channel; and means for remotely cleaning the screening means comprising

(1) means for remotely opening the movable portion of the first side of the conduit adjacent to the undulating plates; and

(2) means for remotely moving at least some of the plates to outside of the conduit through the opening defined by said movable portion and in a direction transverse to the direction of fluid flow in the conduit while at least instantaneously increasing the distance separating the adjacent plates when the plates are outside of the conduit, and for returning the plates to inside of the conduit.

4,387,519

METHOD FOR CONTROLLING THE POSITION OF THE SUCTION HEAD OF A DREDGE IN RELATION TO THE BOTTOM

Rudolf H. Loevendie, Alblasserdam, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed Nov. 20, 1981, Ser. No. 323,587

Claims priority, application Netherlands, Nov. 21, 1980, 8006379

Int. Cl.³ E02F *1/00*

U.S. Cl. 37—195 **1 Claim**

1. A method for controlling the position of the suction head of a moving dredge in relation to a sludge layer on the bottom, comprising directing, from a point on the dredge, in the direction of movement of the dredge, an acoustic pulse series through the water to the sludge on the bottom a substantial distance in front of the suction head, receiving reflected said pulses, determining the time difference between transmission and reception of the pulses, determining the loss of energy of the reflected pulses in comparison to the transmitted pulses, determining the configuration and composition of the sludge layer on the bottom as well as the preferred position of the suction head in relation to said sludge layer on the basis of the two said differences, and controlling the vertical position of the suction head in accordance with the last-mentioned determination so that the suction head will be in said preferred position when the suction head passes over that position of the sludge layer as to which said last-mentioned determination was made.

4,387,520

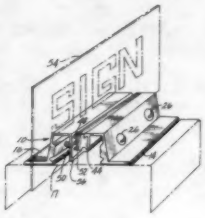
SIGN HOLDER

James E. Ahrens, 435 N. Old Ranch Rd., Arcadia, Calif. 91006

Filed Jan. 5, 1981, Ser. No. 222,599

Int. Cl.³ G09F *3/18, 1/10, 7/02;* A47F *7/14*

U.S. Cl. 40—16.6 **12 Claims**



1. A holder for an essentially thin rigid planar sign, the holder comprising:

a base;

first and second rigid walls formed in the base;

a V-shaped groove defined by the first and second walls within the base, the groove being adapted for receiving an edge of the sign; and

resilient blade means mounted in the base, the blade means oriented for urging a sign inserted in the V-shaped groove against the first wall, the V-shaped groove restraining an edge of the sign so that the sign is prevented from rotation away from the wall;

the first and second walls being characterized in that they define a fixed angle therebetween during insertion and removal of the sign,

the blade means being characterized in that there is a deformation thereof during insertion and removal of the sign to facilitate ease of insertion and removal.

4,387,521

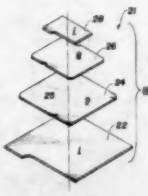
ALPHA NUMERIC CHARACTER ARRANGEMENT

Donald C. Wilhelm, 110 Clarion Dr., Whitesboro, N.Y. 13492

Filed Jul. 21, 1981, Ser. No. 285,479

Int. Cl.³ G09D *3/00*

U.S. Cl. 40—107 **15 Claims**



1. An indicia arrangement for alpha numeric displays including a calendar date, comprising plural visually superposed

substantially block type indicia characters in coaxial relationship, each being of graduated and progressively diminishing sizes uniformly, bottom-to-top, in relation to a reference plane for the indicia arrangement, the individual characters in said arrangement differing in marginal edge profile by being selectively curved, notched and angularly indented to form a respective letter or number and each successive character from the largest character upwardly in the arrangement covering and concealing a central area portion of the next underlying indicia character, whereby the edge profiles of all of the characters in the arrangement coact to produce, in a relatively abstract fashion, a readable sequence of indicia characters when read from bottom-to-top in relation to said reference plane.

4,387,522

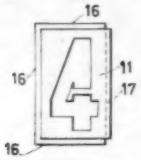
INTERCHANGEABLE ILLUMINATED SIGN

Paul Sommers-Szoszky, 3002-3 Meadowbrook, Windsor, Ontario N8T 3G8, Canada

Continuation of Ser. No. 188,310, Sep. 18, 1980, abandoned. This application Apr. 20, 1982, Ser. No. 370,104

Int. Cl.³ G09F *13/04*

U.S. Cl. 40—576 **1 Claim**



1. A sign illuminated by a fluorescent light comprising, in combination, a rectangular box having an open rectangular front face and having inwardly-extending lugs at the front face to receive fasteners, a rectangular frame of a size to cover the front of the box and having thin flanges extending inwardly around the entire periphery of said frame and defining a rectangular sign opening, said frame having raised bars extending longitudinally thereof on the inner surface thereof and located outwardly of the thin flanges which define longitudinal edges of the sign opening, said raised bars having fastener openings therein, threaded fasteners extending through said fastener openings and being threadedly received in said lugs, a fluorescent light tube located centrally within said box and extending longitudinally thereof, electrical wiring for said light tube located within said box and extending to the outside of said box in the form of an electric cord, a plurality of thin, opaque plates which are rectangular in shape and uniform in height, said plates having transparent indicia in the form of numbers, letters, or designs formed therein, a plurality of spacer blank plates of the same height as said opaque plates serving as spacers between appropriate ones of said thin, opaque plates, as required, the height of all of said plates being substantially equal to the distance between the inner edges of said thin flanges extending longitudinally of the sign opening, each of said plates having thin, rear edge flanges extending beyond the ends of the plate and a rear, thin side flange extending beyond one side edge of the plate, with the opposite side edge of the plate having a front, thin side flange extending beyond the opposite side edge of the plate to engage the rear side flange of an adjacent one of said plates, with said end rear flanges being behind and in contact with the inner surfaces of the longitudinal frame flanges and outer edges of said end flanges being in substantially abutting relationship with edge portions of said raised bars, a light-transmitting plate extending over the backs of said plates and in contact therewith, and clamping means fastened to said raised bars and engaging the back surface of said light-transmitting plate.

4,387,523

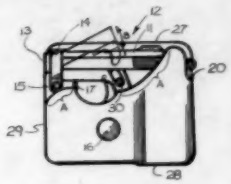
WALLET HOLSTER FOR A SEMI AUTOMATIC WEAPON

Richard N. Gallagher, 918 Waukegan Rd., Glenview, Ill. 60025

Filed Jan. 2, 1981, Ser. No. 222,003

Int. Cl.³ F41C *27/00*

U.S. Cl. 42—1 J **10 Claims**



1. A wallet holster including,

(a) a flat elongated rectangular semi flexible body designed to fold amid its longer dimensions for wrapping forwardly about the sides of a weapon and creating inside and outside surfaces,

(b) a loop of semi flexible material connected to said body at the end most distal from said fold on an inside surface thereof and arranged to carry the barrel end of the weapon parallel to one of the longer dimensions of said body,

(c) openings provided in said forwardly wrapping sides of said holster for permitting control of the weapon trigger without removing the weapon from said holster,

(d) supporting means being semi flexible and carried along an inside surface of said body adjacent said loop and extending toward said fold to cooperatively engage the forwardly lower portions of the weapon,

(e) releasable engagement means juxtaposed on said inside surfaces to hold same together and tightly against the forwardly lower portions of the weapon, and

(f) relief means provided along the folding portion of said body to allow motion of the weapon relative thereto and to permit said longer dimensions of said body to be bent away from the top of the weapon.

4,387,524

FIREARMS WITH RECHARGEABLE MAGAZINE

Norman T. Brint, and Leon J. Williams, both of Waltham Abbey, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB81/00118, § 371 Date Mar. 15, 1982, § 102(e) Date Mar. 15, 1982, PCT Pub. No. WO82/00346, PCT Pub. Date Feb. 4, 1982

PCT Filed Jul. 1, 1981, Ser. No. 361,920

Claims priority, application United Kingdom, Jul. 14, 1980, 8022931

Int. Cl.³ F41C *25/02, 15/00, 11/00, 19/00*

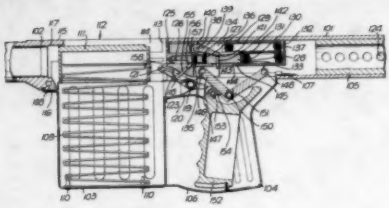
U.S. Cl. 42—18 **6 Claims**

1. A firearm including a body (**101**) and having a magazine characterised in that one or more rimmed rounds (**74**) of ammunition may be stacked each in contact with an adjacent round; resilient magazine bias means (**109**);

a breech opening (**112**) through which a round of ammunition may be inserted into the magazine, the breech opening defining transverse guide means (**113, 114**) through which a round can be inserted in a direction transversely of the barrel axis against the action of the magazine bias means, and restraining means (**114,115**) which are effective on subsequent forward movement of the inserted round to restrain the round in the breech against the action of the magazine bias means;

a catch (**118**) which can assume a locking position in which it prevents return of a round forwardly located in the

breech to a position in which it can re-enter the transverse guide means; further guide means (116) by which a round in the breech can be guided in a direction transversely of the barrel axis and rearwardly into the magazine against the magazine bias means on insertion of a further round into the breech;



the catch (118) being effective to keep separate the rims of one round (74) and a subsequently inserted round during the insertion of the subsequently inserted round, whereby the subsequently inserted round when engaged in the breech has its rim forward of the rim of the said one round.

4,387,525

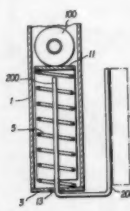
MAGAZINE ENGAGEMENT DEVICE

Daniel D. Musgrave, 8201 Caraway St., Cabin John, Md. 20818

Filed Jul. 15, 1981, Ser. No. 283,505

Int. Cl.[3] F41C *25/02*

U.S. Cl. 42—50 12 Claims



1. In a cartridge magazine including a casing having a compression spring positioned therein, passage means positionally adapted for insertion of support means into a void encompassed by said spring whereby said magazine can be supported in an extended manner.

4,387,526

FIREARM

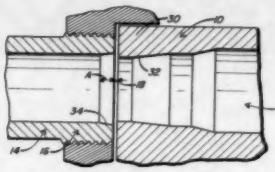
Paul E. Brouthers, Monson, and Robert W. MacWilliams, Springfield, both of Mass., assignors to D.W.A. Associates, Inc., Monson, Mass.

Filed Dec. 24, 1980, Ser. No. 219,903

Int. Cl.[3] F41C *1/00*

U.S. Cl. 42—59 5 Claims

1. In a firearm having a cylinder with round chambers leading to a barrel throat, the improvement comprising, said round chambers each having a cartridge accommodating section and a bullet accommodating section with said sections being defined based upon the round being in an unfired rest position in the chamber, said bullet accommodating chamber section including a section tapering from a larger diameter bore remote from the barrel to a smaller diameter bore adjacent the barrel to thereby provide bullet sizing in the cylinder along the tapered bullet accommodating chamber section at a lower velocity level during acceleration than when the bullet is first sized in the barrel, said bullet sizing commencing at a bullet velocity greater than zero with said bullet initially disposed



sufficiently rearwardly in the round chamber so as to be out of contact with said tapered bullet accommodating chamber section in the unfired rest position thereof.

4,387,527

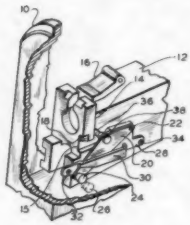
GUN SAFETY

Clifford E. La Fever, Mission Viejo, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 9, 1981, Ser. No. 241,911

Int. Cl.[3] F41C *17/00*

U.S. Cl. 42—70 R 2 Claims



1. A safety for a gun having a frame supporting a longitudinally reciprocatable bolt and a sear operable to engage and restrain said bolt, said safety comprising:

a manually operable member mounted on said frame to reciprocate between a safe and a fire position; and

a catch mounted on said member and positioned to engage and restrain said bolt when said member is in said safe position and operable to restrain said bolt as it reaches a retrogressed position;

wherein said bolt has a shoulder and a slanted face on a side of said bolt opposite said shoulder and wherein said catch is mounted to reciprocate between a retracted and an extended position, said bolt being backwardly moveable to cause said shoulder to engage said catch, causing it to retract and then extend as said bolt reaches said retrogressed position.

4,387,528

SELF SETTING FISH HOOK MEANS

Manfred E. Kahl, 47 Louisa Ct., Northport, N.Y. 11768

Continuation-in-part of Ser. No. 134,108, Mar. 26, 1980, abandoned. This application Jul. 9, 1981, Ser. No. 281,568

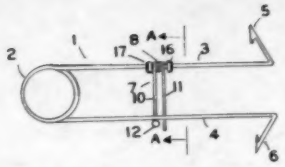
Int. Cl.[3] A01K *83/02*

U.S. Cl. 43—36 3 Claims

1. An invention comprising a fish hook including:

an arm-biasing spring and first and second extending arms, said arm-biasing spring biasing said first and second extending arms apart; first and second hooks respectively disposed on said first and second arms; a coil latch spring wrapped around said first extending arm, said coil latch spring having a first extending member with a hook portion at an end and a second extending member longer than

said first extending member, said coil latch spring biasing said first and second extending members apart, said hook portion operative to hold said second extending arm compressed relatively close to said first extending arm, said hook portion adapted to release said second extending arm when a fish causes said first and second extending arms to



move closer together, and said coil latch spring and said second extending portion are operative to snap said hook portion away from said second extending arm when a fish causes said first and second extending arms to move closer together such that said arm-biasing spring springs said first and second extending arms apart.

4,387,529

ELECTRONIC INSECT KILLER

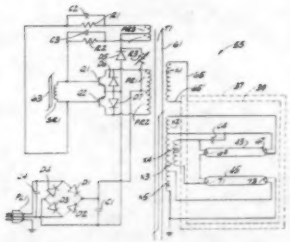
Mark D. Hedstrom, Vincennes, Ind., assignor to Delta Promotions, Inc., Vincennes, Ind.

Continuation-in-part of Ser. No. 42,940, May 29, 1979, Pat. No. 4,248,005. This application Dec. 29, 1980, Ser. No. 220,414

The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.

Int. Cl.³ A01M *1/04, 1/22*

U.S. Cl. 43—112 **9 Claims**



1. An electronic insect killer comprising a plurality of spaced electrodes adapted to be electrically contacted by the bodies of insects, means for attracting insects toward said electrodes comprising at least one fluorescent lamp, and solid state circuitry interconnected with said electrodes and also with said lamp for providing both a high voltage and a lower voltage at a high AC frequency, said high voltage being supplied across said electrodes and said lower voltage being supplied to said lamp for ballast-free energization of said lamp said high voltage being DC.

4,387,530

FLEXIBLE SHEET CONSTRUCTION SYSTEM

Ross Miller, Cambridge, Mass., assignor to ProCreations, Inc., Brookline, Mass.

Filed Feb. 9, 1981, Ser. No. 232,395

Int. Cl.³ A63H *9/00*

U.S. Cl. 46—1 L **16 Claims**

1. System for constructing a variety of simulated organic forms comprising,

means defining an elongated flexible single sheet of abstract form repeatedly 180° bendable about multiple crossing and spaced axis running through the sheet and with an elongated longitudinal axis of symmetry and an outer edge contour having similar re-entrants along edges of the sheet symmetrically arranged on two sides of said longitudinal axis,

fastening means pairs on said sheet including elements of each pair arranged symmetrically on opposite sides of said longitudinal axis and further constructed in staggered form for transverse axis symmetry reassignment of fastening element pairs,

said fastening elements being constructed and arranged for pair assignment and fastening in multiple combinations to define different simulated organic forms,

the elements of at least one of said fastening means pairs being backed by decorative organic-form-suggesting elements (e.g. eyes) on the reverse of said sheet,

said sheet being sufficiently stiff to produce in at least one of said simulated organic form fastened-together combinations a self-supporting shape.

4,387,531

FRICTION TYPE GAME CALL

Bart M. Jacob, Box 184, East Rupert, Vt. 05768

Filed Oct. 5, 1981, Ser. No. 309,199

Int. Cl.³ A63H *5/00*

U.S. Cl. 46—189 **6 Claims**

1. A friction type game call comprising:

a cylindrical wall, having an open, diagonally truncated first end, and a second end,

said cylindrical wall being adapted to be held against the body by a single hand also grasping a striker,

a wall means for closing said second end,

said wall means having an exterior striking surface,

said cylindrical wall having holding means for holding said wall means, and

said cylindrical wall defining at least one hole for the release of sound from said game call.

4,387,532

TOY REMOTE-CONTROL MOTOR BICYCLE

Yoshio Suimon, Tokyo, Japan, assignor to ICD Corporation, Tokyo, Japan

Filed Mar. 16, 1981, Ser. No. 244,407

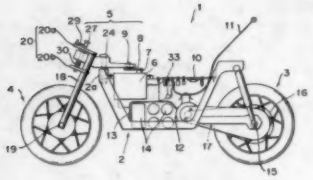
Claims priority, application Japan, Nov. 26, 1980, 55-168388[U]

Int. Cl.³ A63H *17/16, 30/00*

U.S. Cl. 46—254 **6 Claims**

1. In a toy, remote-controlled, motor-driven bicycle including an elongate chassis, a rear wheel rotatably mounted on the

rear portion of said chassis, a steerable front wheel rotatably mounted on the front portion of said chassis, a motor for driving said bicycle, power-supply means for operating said motor, remote control means for receiving external signals and controlling the direction of movement of said bicycle in response thereto, a steerable front-wheel support mechanism rotatably supporting said front wheel, means connecting said front-wheel support mechanism to said chassis and adapted for steering said bicycle by effecting steering movement of said front-wheel support mechanism in unison with said front wheel, the improvement which comprises: said front-wheel support mechanism comprises a steering fork having, at its lower end, an axle on which said front wheel is mounted for rotation; an upper support plate and a lower support plate both fixedly mounted on the upper portion of said steering fork in parallel, vertically spaced-apart relation; said means for effecting steering movement of said front-wheel support mechanism comprising a first, directional steering arm extending forwardly from the upper side of said chassis at the front end thereof, a first support shaft supporting said directional steering arm for pivotal movement with respect to said chassis about a vertical axis, the forward end portion of said directional steering arm extending between said upper and lower support plates, a second support shaft connecting the forward end portion of said directional steering arm to said upper and lower support plates so that said upper and lower support plates can pivot with respect to said directional steering arm about the axis of said second support shaft, the rearward end portion of said directional steering arm extending rearwardly in the lengthwise direction of said chassis and having an elongated guideway therein which guideway is elongated in the lengthwise direction of said chassis, a servomotor mounted on said chassis which servomotor is driven in response to said remote control means, a second arm extending lengthwise of said chassis on the upper side thereof, said second arm having an upwardly projecting pin at the forward end thereof, which pin extends into said elongated guideway in said first, directional steering arm, said servomotor having a drive shaft drivingly connected to the rear end of said second arm for pivotally moving said second arm with respect to said chassis about a vertical axis and thereby causing pivotal movement of said directional steering arm about the axis of said first support shaft, said drive shaft being reversibly rotatable by means of said servomotor.



4,387,533

METHOD AND APPARATUS FOR RETAINING HEAT IN GREENHOUSE AND SIMILAR STRUCTURES

George H. Green, 207 Lake Crescent, Saskatoon, Saskatchewan, Canada (S7H 3A1), and Edward A. Maginnes, 614 Acadia Dr., Saskatoon, Saskatchewan, Canada (S7H 3V9)

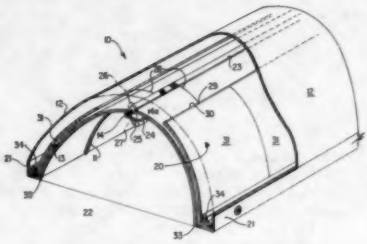
Filed Aug. 1, 1980, Ser. No. 174,512
Int. Cl.³ A01G *9/00*; E04B *1/12*
U.S. Cl. 47—17 **48 Claims**

1. A structure comprising:

(A) an enclosure having an outer light-transparent wall and an inner light-transparent wall spaced apart from said outer wall;

(B) means for charging the space between said outer wall and said inner wall with air under pressure, said air having a dew point so selected that it will not allow condensation to occur;

(C) an insulating layer disposed in, and bathed on both sides by said pressurized air space which is situated between said outer wall and said inner wall, said insulating layer comprising an insulating blanket which is disposed in said pressurized air space which is situated between said outer wall and said inner wall, said insulating blanket having a leading edge and a trailing portion and being movable between an extended covering position and aretracted stored position within an enclosed storage area;



(D) operating means connected to said leading edge of said insulating blanket and positively operable to move said leading edge from its said retracted stored position to its said extended covering position; and

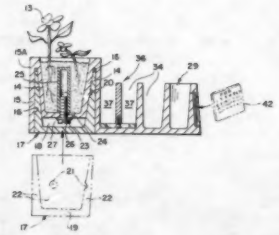
(E) means operatively associated with said trailing portion of said insulating blanket and adapted to draw said insulating blanket from its said extended covering position to its said retracted stored position.

4,387,534

BOOK END PLANTER

Raymond J. Lewandowski, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadwy, both of New York, N.Y. 10007

Filed Aug. 10, 1981, Ser. No. 291,300
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—66 **2 Claims**



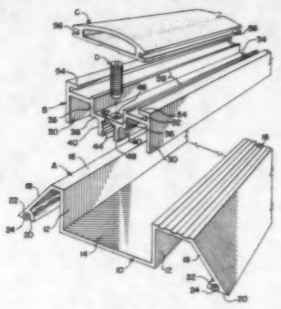
1. A book end planter comprising in combination, a main body member including a plant pot at one end thereof and a pen and pencil caddy at its opposite end, a secret pocket under said pot closed by a downwardly removable cover, a screw vertically movable by a hidden stem in said pot for urging against said cover for removal thereof, and a plurality of mail slots formed between said pot and caddy by means of vertical partitions upon a horizontal base wall of said mail body.

4,387,535

ADJUSTABLE THRESHOLD ASSEMBLY

Thomas A. Corbo, University Heights, Ohio, assignor to Manco Tape, Inc., Cleveland, Ohio

Filed Dec. 7, 1981, Ser. No. 328,200
Int. Cl.³ E06B 1/70
U.S. Cl. 49—468 8 Claims



1. An adjustable threshold assembly comprising an elongated base member adapted to rest upon and be secured to a floor, said base member being provided with an upwardly-opening longitudinal channel comprised of parallel vertical side walls and a connecting horizontal bottom wall, an extruded elongated metal bar insert member extending longitudinally within and vertically adjustable in said channel and having vertical outer side walls connected by a transverse bridge wall, an elongated transversely upwardly-arched sealing strip of resilient deformable material extending along and overlying the bridge wall of and disengageably secured along its opposite side edges to said bar member, said bar member having a pair of longitudinally extending parallel inner walls extending vertically from the bridge wall in spaced side-by-side relationship, and a plurality of height adjusting screws extending vertically downward through openings in said bridge wall and through the space between and in self-tapped screw thread-like engagement with said inner walls at spaced points therealong to bear at their lower ends against the bottom wall of said channel, the facing inner sides of the said inner walls having longitudinally extending extruded serrations therein of a cross-sectional shape approximately matching the cross-sectional shape of the screw threads of said adjusting screws to facilitate the self-tapping of the adjusting screws into said screw thread-like engagement with said inner walls.

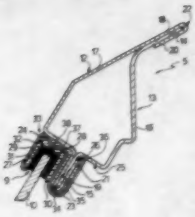
4,387,536

MOTOR VEHICLE DOOR

Luigi Prato, Reano, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Jul. 9, 1981, Ser. No. 281,686
Claims priority, application Italy, Jul. 21, 1980, 53409/80[U]
Int. Cl.³ B60J 5/04
U.S. Cl. 49—502 4 Claims

1. A motor vehicle door (1) comprising a window aperture (9) closed by a window (10) and upperly defined by a tubular frame (5) supporting a guide channel (27) for said window (10) and comprising two curved elements (12, 13) of substantially U cross-section disposed with their concavities facing each other, said two elements (12-13) being seamed together along their outer peripheral edge, characterized in that said two elements (12-13) are seamed together along their inner peripheral edge and define a rib (23) extending radially inwards that divides the surface of said frame (5) facing said window aperture (9) into a first portion (24) facing outwards from the motor vehicle and a second portion (25) facing the interior of the motor vehicle, said guide channel (27) extending along said frame (5) substantially in contact with said rib (23) and on that side thereof facing outwards from the motor vehicle, support and connection means (33) being provided for supporting said channel (27) in contact with said frame (5) and with said rib (23), and with



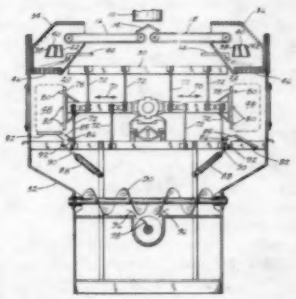
said guide channel (27) having a substantially U cross-section and comprising two flanges (29-30) parallel to said rib and a web (28) extending along said first portion (24) and having a width substantially equal to that of this latter.

4,387,537

DEBURRING AND CLEANING MACHINE AND PROCESS

Maurice P. Roach; Russell D. Burkhart, and James B. Meehan, all of Waterloo, Iowa, assignors to Iowa Engineered Processes Corp., Waterloo, Iowa

Filed May 1, 1981, Ser. No. 259,660
Int. Cl.³ A24B 31/00
U.S. Cl. 51—17 8 Claims



1. A cascading deburring machine, comprising a substantially open framework;

vibratory means comprising a power means driving a shaft connected to a crankshaft which causes reciprocal movement mounted in said framework;

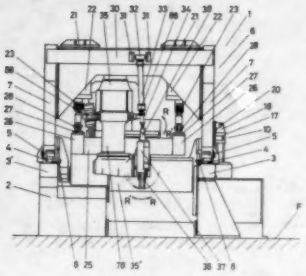
a workpiece mounting plate responsively connected to said vibratory means for responsive movement and reciprocal movement of said mounting plate within said open framework in a predetermined pattern; said workpiece mounting plate being positioned within said framework but in a freely open portion of said framework and cascading means positioned on said framework above said mounting plate to cascade free falling abrasive media within said framework and over, around and through interior portions of any article to be cleaned which might be mounted to said mounting plate.

4,387,538

GRINDING MACHINE ASSEMBLY

Oshimi Tetsuro, Nagoya, Japan, assignor to Noritake, Co., Limited, Nagoya, Japan

Filed Oct. 5, 1981, Ser. No. 308,856
Int. Cl.³ B24B 7/02
U.S. Cl. 51—35 3 Claims



1. A grinding machine assembly including a tiltable frame mounted in a machine frame movable back and forth on a machine base by a hydraulic cylinder assembly, a balancing pneumatic cylinder suspended from an upper portion of the machine frame and supporting the tiltable frame for tilting movement, a frame mounted on the tiltable frame for lateral slidable and angular movements, and a rocking cylinder connected between a side bar of the tiltable frame and the frame, characterized in that a lateral positional correction cylinder is connected between a rotative bar in the frame and a support plate, and that a motor for driving a grinding wheel is mounted rearwardly on the frame and is operatively coupled through a bevel-gear mechanism to a grinding head including said grinding wheel and angularly movable in the horizontal plane, there being a hydraulic cylinder pivotally connected to the machine frame at its front, upper portion and having a piston rod pivotally connected at its distal end to said grinding head.

4,387,539

VIBRATORY ACTUATOR

Kenneth J. Fewel, Nacogdoches, Tex., assignor to The Hutson Corporation, North Mansfield, Tex.

Filed Mar. 30, 1981, Ser. No. 248,802
Int. Cl.³ B24B 31/00
U.S. Cl. 51—163.2 13 Claims

1. A vibratory actuator, comprising:

a tubular housing having a predetermined bending stiffness;

a rotatable quill shaft extending longitudinally through said housing, said shaft having a maximum bending stiffness which does not exceed 2% of the predetermined bending stiffness of said tubular housing such that said housing and said shaft have unmatched deflection characteristics;

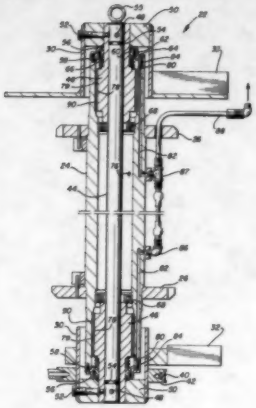
a pair of journal members secured to said shaft in spaced apart relationshp, said journal members having cylindrical external surfaces dimensioned to define hydrodynamic bearings with adjacent corresponding internal surfaces of said housing;

thrust bearing means positioned inward of each journal member for axially supporting said journal members and said shaft within said housing;

a retainer positioned outward of each journal member and secured to said housing in surrounding spaced apart relationship with said shaft;

seal means positioned between each retainer and corresponding journal member for closing said housing and circumferentially engaging said shaft;

eccentric weight means secured to said shaft and located exterior of said housing centered over each journal member for effecting vibration upon rotation of said shaft; and



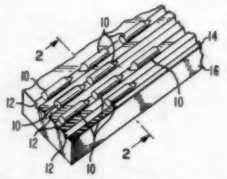
means for directing lubricant to the hydrodynamic bearings between said journal members and said housing.

4,387,540

METHOD OF FORMING REFERENCE FLATS ON STYLI

Robert E. Harwood, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 2, 1981, Ser. No. 298,587
Int. Cl.³ B24B 1/00
U.S. Cl. 51—281 R 9 Claims



1. A method of forming reference flats on a plurality of styli comprising the steps of:

placing the styli lengthwise in parallel grooves disposed adjacent the surface of a first plate, the depth of said grooves allowing the top portions of said styli to project above the surface of said first plate,

applying a coating of adhesive material to the flat surface of a second plate,

pressing the adhesive coating on the surface of said second plate against the surface of said first plate until the top portions of said styli are held firmly against the surface of said second plate,

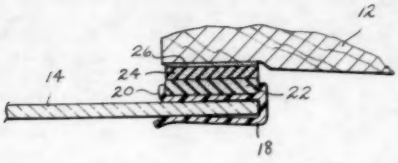
lifting off said second plate from said first plate, whereby said styli remain adhered to said second plate and separate from the surface of said first plate, and

grinding the exposed portions of said styli to form reference flats by moving an abrasive surface in a direction along the lengthwise orientation of said styli.

4,387,541
WINDOW ASSEMBLY WITH MAGNETICALLY ATTACHABLE GLAZING PANELS

Norris L. Boomershine, 1612 N. Bay Dr., Elkhart, Ind. 46514

Filed Feb. 12, 1981, Ser. No. 233,893
Int. Cl.³ E06B 3/26
U.S. Cl. 52—202 1 Claim

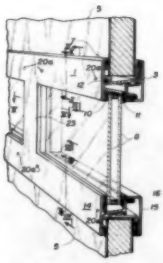


1. In a window assembly including a peripheral frame defining a window opening, a glazing panel for spanning said window opening, the dimensions of said panel being greater than the dimensions of said opening, a permanent magnetic strip secured about the periphery of said panel, the improvement comprising a compatible permanent magnetic strip having first and second sides, an adhesive binder applied at said first side of said compatible strip, said compatible magnetic strip secured about said peripheral frame by said binder, said panel attached to said peripheral frame by the magnetic attraction of said first mentioned magnetic strip and said compatible magnetic strip along the second side of the compatible magnetic strip.

4,387,542
INTEGRATED WINDOW AND WALL SYSTEM

David M. Wehr, Sewickley, Pa., assignor to Cyclops Corporation, Pittsburgh, Pa.

Filed Apr. 17, 1980, Ser. No. 140,454
Int. Cl.³ E06B 7/14
U.S. Cl. 52—209 13 Claims

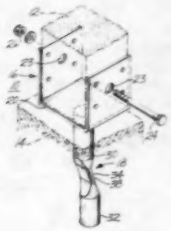


1. A window and wall system comprising a horizontally extending, ladder-like outer metal member and a correspondingly shaped ladder-like inner metal member spaced therefrom in confronting relationship, the upper longitudinal portions of said ladder-like metal members comprising head portions, the lower longitudinal portions comprising sill portions, and the vertically extending cross portions bridging said head and sill portions comprising mullion portions, upper insulating wall panel sandwiched between the head portions and lower insulating wall panel sandwiched between the sill portions; the head portion of said ladder-like outer metal member having an inner wall, an integral flange extending from an intermediate portion of said inner wall in a slight angularly upward direction and terminating in a vertically upwardly extending support for the inner lower edge of said insulating wall panels and to form gutters for water drainage, the sill portion of said ladder-like outer metal member having an inner wall, an integral flange emerging from an intermediate portion of said last mentioned inner wall in a slight angularly upward direction and terminating in a vertically upwardly extending support, a plurality of windows sandwiched between said inner metal wall of said ladder-like outer metal member and said vertically upwardly extending support of said outer and inner metal walls in the openings thereof, thermal insulation between said last mentioned support and the lower edges of said windows and between said ladder-like outer and inner metal members to prevent conduction of cold or heat there between and bridging means for bridging together end-to-end lengths of said ladder-like outer and inner metal members to provide an extended horizontal row of windows separated by said mullions.

4,387,543
ANCHOR BRACKET

J. Donald Tschan, Bellevue, and Clifford P. Hatton, Seattle, both of Wash., assignors to P. H. Bowman Co., Inc., Seattle, Wash.

Filed Feb. 5, 1981, Ser. No. 231,630
Int. Cl.³ E04C 5/18; E04B 1/38; E02D 27/00
U.S. Cl. 52—295 4 Claims



1. A bracket for anchoring a column member in a bed of concrete and supporting the bottom of the member slightly above the concrete, comprising:

a channel shaped upper section with parallel, upwardly extending flanges adapted to be attached to the member to be anchored; and

an elongate lower post section joined to and extending downwardly from substantially the center of said upper section and of generally hollow tubular form with a substantially uniform wall thickness throughout, the upper portion of said post section being centered about a vertical axis substantially coincident with the center of said upper section, and the lower portion of said post section being centered about a vertical axis substantially parallel to and offset from the vertical axis of the post upper portion by an amount approximately one-half the diameter of the post section, said upper and lower post sections being joined by a generally central portion formed by flattening together opposed wall portions of the post section, such central portion as thus formed being characterized by the flattened wall portions being parallel and contiguous to each other and non-parallel to the axes of the upper and lower portions of said post section.

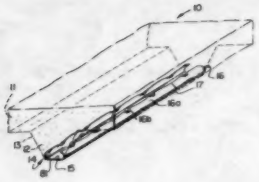
4,387,544
REINFORCING STRIPS FOR PRE-CAST CONSTRUCTION ELEMENTS

Herbert K. Schilger, 916 Thornycroft N.W., Calgary, Alberta, and John S. Hall, 881 Thorndale Dr., Ottawa, Ontario, both of Canada

Continuation-in-part of Ser. No. 42,332, May 25, 1979, abandoned. This application Jul. 3, 1980, Ser. No. 165,772
Int. Cl.³ E04B 5/23
U.S. Cl. 52—405 5 Claims

1. A precast building construction element comprising a panel unit of set cementitious material having at least one integrally formed set cementitious projection extending along

the length thereof and a metal reinforcing strip mechanically embedded in the edge of said projection remote from said panel, said reinforcing strip comprising an elongated unitary strip made from about 14–30 gauge sheet steel having a substantially flat central web portion, with the side edges of said web merging by way of rounded corners of small radius into flanges extending away from said web, at least the free longitudinal edges of said flanges being inclined inwardly, said longitudinal flange edges having longitudinally spaced rounded depressions of small radius pressed downwardly therein, said depressions causing associated deformation of the flanges less



than the full depth of the flanges, leaving substantially undeformed longitudinal portions of the flanges adjacent the central web, and the portions of said longitudinal flange edges between said rounded depressions being outwardly bowed, whereby a double curvature is developed with substantially all the flange areas being curvilinear and more than 50% of a cross-section through the strip being curved, thereby providing maximum membrane resistance within said strip with minimum bending or flexing stresses, and said reinforcing strip being embedded with flanges of the strip embedded in the cementitious material and the central web portion adjacent the element edge face.

4,387,545

PANEL ASSEMBLY AND A METHOD OF CONSTRUCTING SAID ASSEMBLY

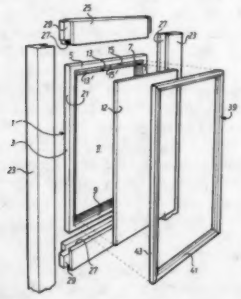
John T. Kern, The Grange, Budworth Rd., Noctorum, Birkenhead, Merseyside, L43 9TL, England

Filed Jul. 23, 1980, Ser. No. 171,650

Claims priority, application United Kingdom, Jul. 26, 1979, 7926021

Int. Cl.³ E06B *3/70*

U.S. Cl. 52—455 **10 Claims**



1. A panel assembly for use as a door or as a section of a planar surface, comprising a plurality of previously formed fixed frames, each fixed frame comprising for integrally interconnected elongate side member which define a beading on an outer surface, an exact rectangular exterior configuration, a rectangular aperture and a plurality of fastener apertures, a main framework formed around said fixed frames, said main framework comprising a plurality of grooved elongated framework members, said fixed frames being provided with flange means adapted to seat in a groove of said elongated framework members, a plurality of cross members, each of said cross members being formed with tongue means adapted to fit into a respective groove of an opposing elongated framework member and defining at least one groove cut therein adapted to receive and hold said flange means of at least one of said fixed frames the prior exact configuration of the fixed frames aiding in the exact construction of the panel assembly, a panel member adapted to be mounted to each of said fixed frames covering said rectangular aperture, a completion frame adapted to be positioned opposite each said fixed frame, said completion frame defining a plurality of apertures which are adapted to be aligned with the fastener apertures of said fixed frame, and fastener means adapted to extend through said completion frame apertures and said fixed frame fastener apertures to hold said panel member in a stationary position therebetween.

4,387,546

STRUCTURAL COLUMN AND METHOD OF MANUFACTURE

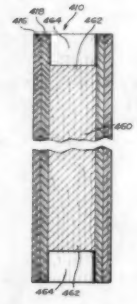
Yukio Kurita, Neyagawashi, and Satoshi Nakagawa, Hirakatashi, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 30, 1980, Ser. No. 164,324

Claims priority, application Japan, Jan. 29, 1980, 55-9146

Int. Cl.³ E04C *3/12*

U.S. Cl. 52—731 **4 Claims**



1. A structural column, comprising:

an outer member composed of a plurality of individual, thin wooden layers laminated together to form a hollow cross-sectional shape, said outer member including two substantially identical, preformed halves joined together to define a closed configuration, each half having formed, marginal shoulder portions terminating at diagonally disposed, longitudinal edges which abut closely against a matching, diagonally disposed edge of the corresponding formed marginal shoulder portion of the opposite outer member half to form a continuous corner joint;

at least one inner member composed of a plurality of individual, thin wooden layers laminated together to form a hollow, cross-sectional shape corresponding to the cross sectional shape of said outer member to closely underlie said outer member, each of said inner members including two substantially identical, preformed halves joined together to form a closed configuration, each inner member half having formed marginal shoulder portions terminating at diagonally disposed, longitudinal edges which abut closely against a matching diagonally disposed edge of the corresponding formed marginal shoulder portion of the opposite inner member half to form a continuous corner joint; and

a center core snugly occupying the hollow interior of said inner member, said core extending longitudinally through said inner member with the ends of said core terminating

a short distance inwardly from each end of said inner member to define a longitudinally open socket within each end portion of said column.

4,387,547

DEVICE FOR MANUFACTURING PACKAGES FILLED WITH LIQUID

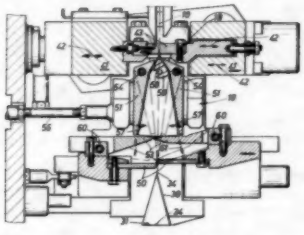
Wilhelm Reil, Bensheim, Fed. Rep. of Germany, assignor to Tetra Pak Developpement S.A., Pully, Switzerland

Filed Oct. 15, 1980, Ser. No. 197,077

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1979, 2946059

Int. Cl.³ B65B *9/08, 51/30*

U.S. Cl. 53—131 **8 Claims**



1. In a packaging device for the manufacture of liquid filled paper packages in which a web of paper is converted into a tube and which is displaced in a step-by-step manner vertically downwardly into a forming device, including longitudinal and transverse embossing apparatus for forming initial bend lines on the web corresponding to the folds of the package, and a pair of sealing jaws which work together for transversely sealing the tube at locations corresponding to the beginning and ending edges of a package formed in the tube, and in which a pair of cutting blades are disposed the length of one of the feeding steps beneath the sealing jaws for separating a formed and filled package from the tube in the region of the transverse welded seam, the improvement comprising:

a forming station including at least one pair of package forming and supporting generally downwardly depending jaws extending in a direction generally longitudinally of a package to be formed in said web, and

said forming jaws mounted on generally transverse axes of rotation one on each side of said web so that the jaws are movable between a first position in which the inner surfaces of the jaws are inwardly inclined toward each other to support the side walls of the package during initial filling and movable to a second spread-apart position accommodating and defining the full width of the package when the package is completely filled.

4,387,548

POWER ASSISTED ROLLER-STRETCH WRAPPING PROCESS

Patrick R. Lancaster, Anchorage, and William G. Lancaster, Louisville, both of Ky., assignors to Lantech, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 96,384, Nov. 21, 1979, Pat. No. 4,302,920. This application Sep. 8, 1980, Ser. No. 184,787

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.³ B65B *11/04*

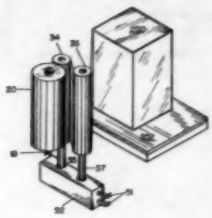
U.S. Cl. 53—399 **18 Claims**

1. A process of making a unitary package by wrapping a plurality of units with a stretched plastic material overwrap forming a unitary load comprising the steps of:

a. transporting a web of plastic film to a stretching means comprising speed connected roller means partially driven by positive torque means;

b. elongating the film in the stretching means over its yield point, thereby gaining substantially in strength per cross-sectional area and modulus;

c. relieving the force on the film web wrapped around the load by applying a positive torque to the speed connected roller means with said positive torque means; and



d. reducing the variations in force and elongation of the film on the load by substantially controlling the positive torque means to a relatively constant level less than that which is required to elongate the film in said stretching means thereby utilizing the connection of the film to the load partially driving said speed connected roller means and transmitting speed changes to the positive torque means; and

e. wrapping said elongated film around the load.

4,387,549

METHOD OF MANUFACTURING A PACK FOR OVOIDAL OBJECTS

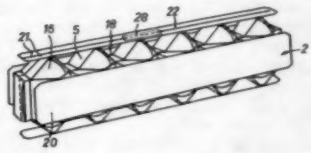
Toni Casutt, Blumenrain 24, CH-8702 Zollikon, Switzerland

Filed Apr. 7, 1981, Ser. No. 251,732

Claims priority, application Switzerland, Apr. 9, 1980, 2714/80

Int. Cl.³ B65B *43/08*

U.S. Cl. 53—456 **2 Claims**



1. A method of manufacturing a packing container, particularly for eggs, comprising the steps of:

(a) production of a first cardboard blank (2) to cut it longitudinally into five lengthwise running strips (3) which are held together at each end by an integral cross strip (4);

(b) production of a second cardboard blank (5) longer than said first cardboard blank (2) and having interrupted lengthwise slits (6) along four parallel lengthwise running lines and formation of transverse bending lines on said second cardboard blank (5) suitable for producing flat-topped transverse corrugations;

(c) forming waves (13) forming transverse corrugations of flat-topped wave form (13) out of said second cardboard blank (5) and adhesively sticking them onto said first cardboard blank (2) along each of the wave bottoms (9);

(d) bending over said waves (13) by tucking in the flat-top portions to form a flattened scale-like structure;

(e) separation of the adhesively-joined places along the boundaries of the already separated lengthwise strips (13) of said first cardboard blank (2), and

(f) cutting off the two cross-strips (4) at the ends of said first cardboard blank (2).

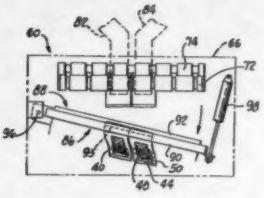
4,387,550
CONTAINER STRIPS AND METHOD OF MAKING AND USING THE SAME

Bernard Lerner, Hudson, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

Continuation of Ser. No. 897,752, Apr. 17, 1978, abandoned, which is a continuation of Ser. No. 749,234, Dec. 10, 1976, which is a division of Ser. No. 612,462, Sep. 11, 1975, Pat. No. 4,041,845. This application Jun. 18, 1980, Ser. No. 160,657

Int. Cl.³ B65B *43/26, 5/04*

U.S. Cl. 53—459 **7 Claims**



1. A method of packaging with an elongated web having at least two strips of preformed bags which are open in one face, the bags being connected end to end and each open along one end and the strips each having a bead extending longitudinally along a side edge of the strip, two of the beads being side by side and being connected by bridges of strip material which are thinner than the beads and the remainder of the strips, the bags being in aligned sets with each set including one bag from each strip, comprising:

(a) positioning the web at a supply station;

(b) longitudinally feeding the web along a path of travel from the supply to a loading station to position the bags at the loading station one set at a time while maintaining the integrity of the bridges along at least a substantial portion of the path of travel to maintain the strips of the bags of each successive set aligned while at the loading station;

(c) opening the bags of each set at least when that set is at the load station;

(d) loading the bags while at the load station by inserting an object into each open bag;

(e) closing each bag after its object has been inserted and securing such closure;

(f) separating the strips by breaking the bridge of material without affecting the beads; and,

(g) separating the closed bags from the strip in groups of one or more bags.

4,387,551
HEAT-SEALABLE, OVENABLE CONTAINERS AND METHOD OF MANUFACTURE

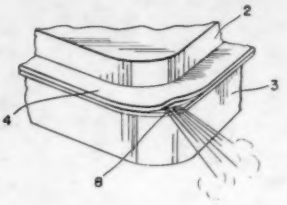
David A. Cowan, Owings Mills, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Division of Ser. No. 77,548, Sep. 21, 1979, Pat. No. 4,261,504. This application Dec. 31, 1980, Ser. No. 221,908

Int. Cl.³ B65B *7/28, 51/10*

U.S. Cl. 53—478 **13 Claims**

1. A method for heat-sealing an ovenable board container containing a tray portion and a closure portion, one of said tray portion or said closure portion being provided with a thermoplastic polyester coating and the other of said tray portion or said closure portion being provided with a cross-linked, thermosetting polyester-containing coating, which comprises placing said tray portion and said closure portion into mutual contact to form an assembled container, and heat-sealing said assembled container at a temperature of about 496° to 650° F.



and at a contact pressure of about 108 to 200 psi to form a self-venting, easy-tear seal.

4,387,552
WRAPPING APPARATUS

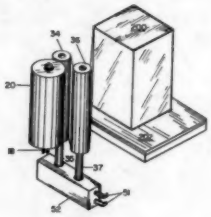
Patrick R. Lancaster, Anchorage, and William G. Lancaster, Louisville, both of Ky., assignors to Lantech, Inc., Louisville, Ky.

Division of Ser. No. 184,787, Sep. 8, 1980, and a continuation-in-part of Ser. No. 96,384, Nov. 21, 1979, Pat. No. 4,302,920. This application Dec. 12, 1980, Ser. No. 215,684

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.³ B65B *11/04*

U.S. Cl. 53—556 **10 Claims**

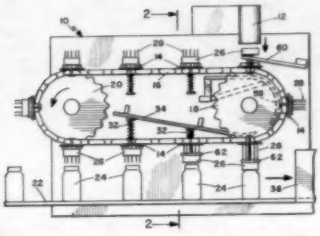


1. An apparatus for making a unitary package from a plurality of units forming a load using a web of stretchable plastic material to form an overwrap, comprising means to provide relative rotation between a dispensing means and a load, a frame mounted adjacent said means to provide relative rotation, plastic material dispensing means mounted to said frame, material elongation means positioned between said dispensing means and means to provide relative rotation adapted to at least partially drive said elongation means via the plastic material web and receive stretchable plastic material pulled from said dispenser means, said elongation means elongating the stretchable plastic material beyond its yield point, said elongation means restricting said plastic material after it has been dispensed from the dispenser means as the material web is pulled from the dispenser means through the elongation means by said relative rotation so that a downstream portion of the material web is transported faster than the upstream portion causing the material web to elongate before it reaches the load, said elongation means comprising a roller means, a positive torque means operatively connected to said roller means and partially driving said roller means for applying a substantially constant positive torque to said roller means to reduce the stretch force on the film web being wrapped on the load to a level less than the force required to pre-stretch the material web in said elongation means, and means to power said positive torque means.

4,387,553
BANDING APPARATUS

Eric W. Strub, and Kenneth M. Strub, both of 235 Rockhill Rd., Vista, Calif. 92083

Filed Jan. 2, 1981, Ser. No. 222,004
Int. Cl.³ B65B 5/00
U.S. Cl. 53—585 12 Claims

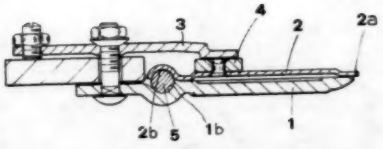


1. A banding apparatus comprising:
a source of endless bands,
gripping means comprising a base member having a central axis,
a plurality of fingers mounted about and extending generally parallel to said axis and movable radially inward toward said axis and radially outward from said central axis for simultaneously gripping and expanding a band to encircle an article,
first means for moving said fingers radially inwardly toward said axis for receiving a band,
second means for moving said fingers radially outwardly for gripping said band, and
transport means for transporting said gripping means from a position at said source of endless bands to a position of encircling an article with said band.

4,387,554
CUTTER BAR

Erminio Bedogni, Via Mascagni 36, Reggio Emilia, Italy (42100)

Filed Oct. 22, 1981, Ser. No. 313,826
Claims priority, application Italy, Dec. 5, 1980, 29065/80[U]
Int. Cl.³ A01D 55/02
U.S. Cl. 56—296 5 Claims

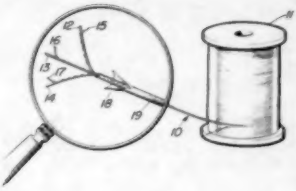


1. In an improved cutter bar arrangement comprising
(a) a stationary comb including a plurality of teeth;
(b) a toothed blade adapted to slide back and forth in an alternating motion upon the teeth of said stationary comb; and a
(c) blade-retaining means for maintaining contact between said stationary comb and said toothed blade, the improvement wherein:
said stationary comb and said blade are provided with respective longitudinally disposed recesses so opposed as to establish an enclosed channel, and wherein said arrangement further comprises a rod of a size corresponding to said enclosed channel and slidably received therein, said stationary comb and said blade being so shaped that, when said rod is removed from said channel, said blade slides freely off of said stationary comb in a direction transverse to said comb.

4,387,555
ORNAMENTAL THREAD AND METHOD OF FORMING SAME

Stuart A. Robinson, Paxton, Mass., assignor to Robinson Thread Company, Worcester, Mass.

Filed Sep. 28, 1981, Ser. No. 305,965
Int. Cl.³ D02G 3/12, 3/34
U.S. Cl. 57—235 10 Claims

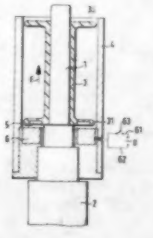


1. Ornamental thread, comprising:
(a) a plurality of strands of polymer material, the strands being twisted together in a first direction, and
(b) a narrow strip of metallic film wrapped around each strand in the other direction.

4,387,556
APPARATUS FOR LIFTING A BOBBIN FROM A SPINDLE

Rainer Studtmann, and Erich Bock, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Mar. 6, 1981, Ser. No. 241,217
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009275
Int. Cl.³ D01H 9/04
U.S. Cl. 57—273 6 Claims



1. Apparatus for lifting a bobbin set up on a spindle of a textile machine comprising:
a ring of electrically conductive, nonferromagnetic material carried on at least one end of the bobbin remote from a free end of said spindle, and
an electrically excitable magnet coil carried adjacent a base of said spindle;
said ring being arranged on said bobbin with its end face opposite said magnet coil.

4,387,557

FALSE TWISTING APPARATUS AND METHOD

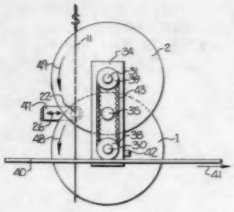
Hellmut Lorenz, Remscheid-Lennep, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 272,939

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111245

Int. Cl.³ D02G 1/08

U.S. Cl. 57—340 10 Claims



1. A yarn false twisting apparatus characterized by the ability to readily convert from S to Z twist and vice versa, and comprising

a frame,

a pair of twist imparting discs, with each disc having a yarn engaging friction surface on one face thereof,

means mounting said discs to said frame and including a carrier plate mounting said discs for rotation about essentially parallel, spaced apart axes and such that portions of the respective yarn engaging friction surfaces are disposed in opposing, substantially non-contacting relationship and define a twisting zone therebetween, and including means pivotally mounting said carrier plate to said frame for selective rotation between first and second operative positions disposed about 180 degrees from each other, and

drive means for rotating each of said discs in a common rotational direction at each of said first and second operative positions,

whereby a yarn may be continuously moved through said twisting zone in a direction parallel to and laterally spaced from a line extending perpendicularly between said axes of rotation and so as to have twist imparted thereto by frictional contact between the yarn and the respective opposed friction surfaces, and wherein conversion from S to Z twist or vice versa may be readily effected by pivoting said carrier plate between said first and second operative positions and without changing the direction of rotation of the discs or the yarn path of travel.

4,387,558

METHOD FOR LINING A HOUSING OF A FIBER OPENING DEVICE AND ROLLER

Siegfried Rehm, Westeranger 4, 8071 Stammham, and Kurt Beizinger, Dorflerstr. 10, 8070 Ingolstadt, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 31,224, Apr. 8, 1979, Pat. No. 4,246,745. This application Dec. 16, 1980, Ser. No. 217,108

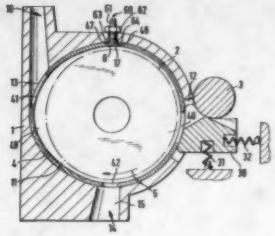
Int. Cl.³ D01H 7/895, 7/892

U.S. Cl. 57—408 2 Claims

1. A method of lining a housing which receives an opening roller of a fiber opening device associated with an open-end spinning apparatus by means of a metal band, wherein the housing comprises apertures surface which connect the interior of the housing to other parts of the spinning apparatus and to which apertures in the metal band correspond, said method comprising:

providing a metal band having free ends defining a joint therebetween;

inserting said metal band in the housing so that said joint as viewed in the direction of conveying of the fiber is between an aperture in the housing leading to a feed passage and an aperture in the housing leading to a delivery device;



tightening the metal band to bear against the inner wall of the housing; and

securing the tightened metal band in the region of the joint in the housing by means of a fixed connection.

4,387,559

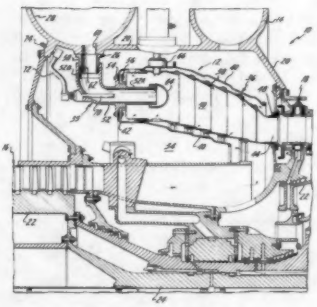
FUEL BURNER AND COMBUSTOR ASSEMBLY FOR A GAS TURBINE ENGINE

Anthony Leto, Franklin Lakes, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed May 13, 1981, Ser. No. 263,288

Int. Cl.³ F02C 7/20, 7/22

U.S. Cl. 60—39.32 18 Claims



1. A fuel burner and combustor assembly for a gas turbine engine having a casing, an air compressor section in said casing, a turbine section disposed within said casing in axial spaced relation to said air compressor section, and at least one fuel supply port means in the casing communicating with a source of fuel and extending radially thereto, the fuel burner and combustor assembly comprising

(a) a housing disposed within the engine casing between the air compressor section and the turbine section and defining therein a combustion chamber;

(b) inlet port means in said housing communicating with the air compressor section and the combustion chamber to receive compressed air from said air compressor section and pass the same into the combustion chamber;

(c) said housing being closed at one end and open at the opposite end to pass gaseous products of combustion from said combustion chamber into the turbine section to drive the latter;

(d) at least one fuel burner attached at one end portion to said closed end of said housing and extending into the combustion chamber to pass fuel into the latter while the opposite end portion slidably engages said radially extend-

ing fuel supply port means for receiving fuel from the latter for passage through the fuel burner; and

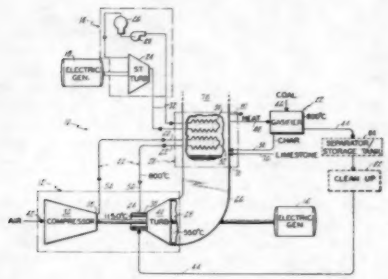
(e) said fuel supply port means and fuel burner coact to anchor the housing against lateral movement and against movement in one axial direction relative to the casing so that thermal growth of the housing is effect in the opposite direction toward the turbine section and to allow relative movement between the combustor and casing in a radial direction while maintaining fuel flow through the fuel burner.

4,387,560

UTILIZATION OF COAL IN A COMBINED CYCLE POWERPLANT

Stuart Hamilton, Glastonbury, and John J. Horgan, Wethersfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 29, 1980, Ser. No. 220,541
Int. Cl.³ F02C *3/28, 7/08*
U.S. Cl. 60—39.02 **4 Claims**



1. A method for producing power from coal in a combined cycle powerplant employing a gas turbine engine formed of a compressor, a combustion chamber, and a turbine connected to a power output device, employing a steam turbine engine including a boiler and a steam turbine connected to a power output device and employing an auxiliary combustor, comprising the steps of:

feeding coal into a partial gasifier;

converting the coal into combustible fluids and combustible char in the partial gasifier such that the amount of char produced has a heating value less than the heating value of the coal fed into the partial gasifier;

burning the char from the partial gasifier in an auxiliary combustor to produce a high temperature gas containing essentially all of the heating value of all of the char formed in the partial gasifier;

transferring a first portion of the heat from the high temperature gas of the auxiliary combustor to the working medium gas of the gas turbine engine to raise the temperature of the working medium gas;

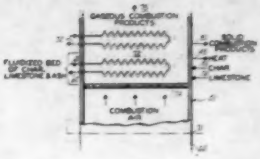
transferring a second portion of the heat from the high temperature gas of the auxiliary combustor to the working medium fluid of the steam turbine engine to raise steam;

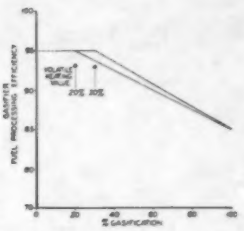
transferring a third portion of the heat from the high temperature gas of the auxiliary combustor to the partial gasifier for converting the coal into combustible char and combustible fluids;

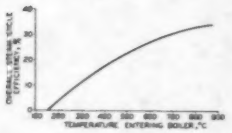
burning the combustible fluid with the working medium gas of the gas turbine engine in the combustion chamber of the gas turbine engine to produce a high temperature working medium gas;

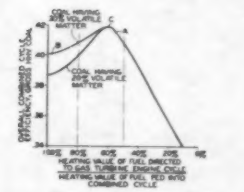
expanding the working medium gases through the turbine of the gas turbine engine to power the gas turbine engine;

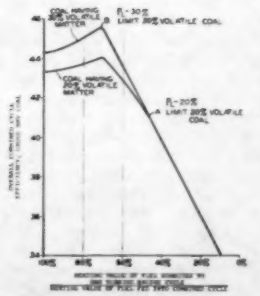
exhausting the working medium gas expanded through the








COAL HAVING 20% VOLATILE MATTER
COAL HAVING 20% VOLATILE MATTER
HEATING VALUE OF FUEL DIRECTED TO GAS TURBINE ENGINE COMBUSTOR
HEATING VALUE OF FUEL FED INTO COMBINED CYCLE



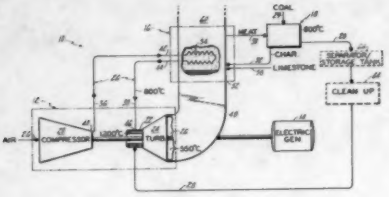
turbine into the auxiliary combustor to provide heat and oxygen to the auxiliary combustor; and

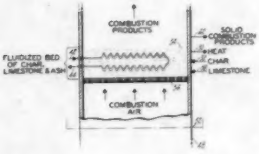
expanding the working medium fluid through the turbine of the steam engine to power the steam turbine engine.

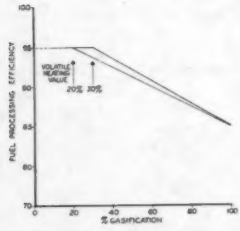
4,387,561
UTILIZATION OF COAL POWERING A GAS TURBINE ENGINE

Stuart Hamilton, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 29, 1980, Ser. No. 220,542
Int. Cl.³ F02C 3/28, 6/18
U.S. Cl. 60—39.02 **4 Claims**







1. A method for completely consuming the heating value of coal in powering a gas turbine engine by using an auxiliary combustor wherein the gas turbine engine has a working medium gas and is formed of a compressor, a combustion chamber, and a turbine, comprising:

feeding the coal into a coal conversion means;

converting the coal into combustible fluids and combustible char in the coal conversion means;

burning all of the char from the coal conversion means in an auxiliary combustor to produce a high temperature gas;

transferring heat from the high temperature gas of the auxiliary combustor to the working medium gas to raise the temperature of the working medium gas after the working medium gas passes through the compressor;

transferring heat from the high temperature gas of the auxiliary combustor to the coal conversion means for converting the coal into combustible fluids and combustible char;

burning the combustible fluid with the heated working medium gas in the combustion chamber of the engine to produce a working medium gas having a temperature in excess of twelve-hundred degrees Centigrade (1200° C.);

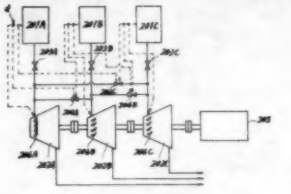
expanding the working medium gases having a temperature in excess of two thousand degrees Fahrenheit through the turbine to power the gas turbine engine;

exhausting the working medium gas expanded through the turbine into the auxiliary combustor to provide heat and oxygen to the auxiliary combustor wherein the coal is consumed to produce energy and the turbine is isolated by the auxiliary combustor from harmful particulates produced by burning the char.

4,387,562
SYSTEM FOR GENERATING POWER WITH TOP PRESSURE OF BLAST FURNACES

Kengo Takao, Kitakyushu; Mineo Ohmachi, Mitaka; Hisatsugu Kihara; Kenshiro Toki, both of Sakai; Yukio Tomita, Osaka, and Toshihiro Mizota, Sennan, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Hitachi Shipbuilding & Engineering Company Limited, Osaka, both of, Japan

Filed Aug. 8, 1980, Ser. No. 176,484
Int. Cl.³ F02C 6/02
U.S. Cl. 60—39.15 **8 Claims**



1. A system for generating power with the top pressure of a plurality of blast furnaces comprising:

a plurality of turbines provided for the plurality of blast furnaces respectively and aligned on an axis with their rotor shafts connected to one another;

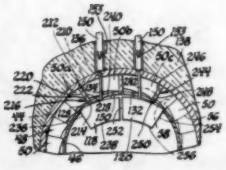
a generator connected to the rotor shafts;

a plurality of main gas channels connecting the blast furnaces to the turbines for leading a gas from the top of the furnaces to the turbines and converting the pressure of the gas into rotational energy to generate power, each main gas channel separately connecting one of the blast furnaces to a corresponding one of the turbines; and interconnecting channel means provided with a flow control valve for connecting optionally selected two of the main gas channels.

4,387,563
ARTICULATED POWER TURBINE GATE

Albert H. Bell, III, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 50,411, Jun. 20, 1979. This application Jun. 23, 1980, Ser. No. 161,744
Int. Cl.³ F02C 3/10
U.S. Cl. 60—39.25 **8 Claims**



1. A variable area gas turbine engine controller for regulating flow of motive fluid from an outlet transition of an air and fuel burning combustor under part load conditions of operation comprising a nozzle having an annular row of turbine nozzle vanes therein defining flow passages, each of said vanes including a leading edge and a trailing edge joined by suction and pressure surfaces formed thereon and joining said leading and trailing edges thereof, means forming valve seat surfaces on the leading edge of at least two of said vanes, a gate valve having an upstream surface thereon faced toward said outlet transition

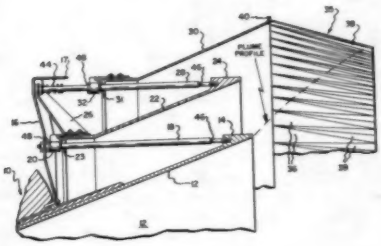
and further including a downstream surface thereon slidably engageable with said valve seat surfaces, means for storing said gate valve out of flow blockage relationship with exhaust flow through said outlet transition through a full 360° extent of said row of vanes thereby to permit unrestricted flow of motive fluid through said nozzle during a full power mode of engine operation, and means for moving said gate valve into a full blocking alignment with said vane row whereby pressurized gas from said outlet transition holds said downstream surface of said gate valve in sealed engagement with said valve seat surfaces.

4,387,564

EXTENDIBLE ROCKET ENGINE EXHAUST NOZZLE ASSEMBLY

Lee F. Carey, North Tonawanda, N.Y., assignor to Textron Inc., Providence, R.I.

Filed Oct. 3, 1980, Ser. No. 193,610
Int. Cl.³ F02K 1/08
U.S. Cl. 60—242 **10 Claims**



1. An extendible rocket thruster exhaust plume nozzle assembly comprising, in combination with a thruster casing having a structurally rigid fixed nozzle extending conically therefrom;

one or more truncated-cone-shaped collars of rigid structural forms carried by slide support means arranged concentrically about said fixed nozzle, the outermost collar thereof being thereby furthermost extendible downstream of the thruster exhaust plume upon firing of the thruster and deployment of said assembly;

a further deployable skirt member perimetrically attached to said outermost of said collars, said skirt member comprising an annularly shaped pleat-folded sheet material fabrication of generally planar configuration retracted within the exit profiles of said collars and when so retracted is located out of the plume exhaust profile;

said collar(s) and said skirt member being nested in compacted relation within the requisite overall profile envelope of said thruster casing and fixed nozzle combination;

restraint means locking said outermost collar member against deployment relative to said casing nozzle;

release means operative upon firing of said thruster to unlock said restraint means;

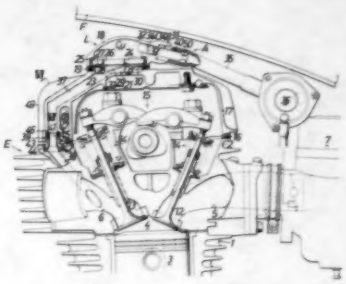
and force supply means operative upon unlocking of said restraint means to propel said outermost collar to slide on its support means in downstream direction relative to the thruster exhaust plume and to move said skirt member into the exhaust plume profile whereupon said skirt member unfolds in response to fluid pressures thereagainst generated by firing of said thruster.

4,387,565

EXHAUST GAS CLEANING SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Junji Otani, Oomiya, and Yasuo Ikenoya, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1981, Ser. No. 244,828
Claims priority, application Japan, Mar. 24, 1980, 55-38352[U]
Int. Cl.³ F01N 3/22
U.S. Cl. 60—293 **19 Claims**



1. In a motorcycle having a frame with a longitudinal axis and on which are mounted a fuel tank and a seat; front and rear wheels suspended from said frame and a multi-cylinder internal combustion engine disposed in a space defined by said fuel tank, said seat and said wheels such that a crank shaft of said engine extends at right angles to the longitudinal axis of said frame, said engine including combustion chambers defined in respective cylinders, a plurality of exhaust ports open in the front of said engine and communicating with respective combustion chambers and exhaust means connected to respective exhaust ports;

an improvement comprising an exhaust gas cleaning system for said multi-cylinder internal combustion engine including:

reed valve means on said engine having inlet and outlet ports and operating in response to pulsating exhaust pressure in said engine;

an upstream secondary air passage connected to said inlet port of said reed valve means and adapted to communicate with the atmosphere to supply secondary air to said reed valve means;

and a plurality of downstream secondary air passages of substantially equal length connected between said outlet ports of said reed valve means and corresponding exhaust ports of said engine to supply secondary air to said exhaust ports, said engine further including a cylinder head and a head cover, said reed valve means including a valve housing mounted on said head cover and defining a valve chamber therewith, and a reed valve in said valve housing dividing said valve chamber into an upstream and a downstream chamber which are connected respectively, to said upstream secondary air passage and said downstream secondary air passages.

4,387,566

INDEPENDENTLY VARIABLE PHASE AND STROKE CONTROL FOR A DOUBLE ACTING STIRLING ENGINE

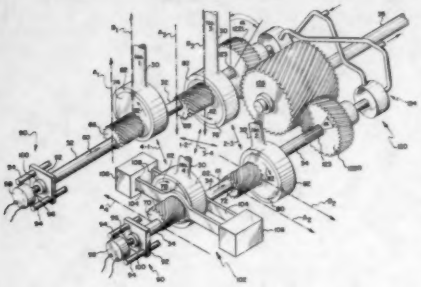
David M. Berchowitz, Scotia, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Mar. 11, 1981, Ser. No. 242,452
Int. Cl.³ F02G 1/06
U.S. Cl. 60—518 **30 Claims**

1. A stroke control apparatus for a Stirling engine having a plurality of pistons coupled to a driveshaft, comprising:

a plurality of rings, one each operatively connected to each of said pistons and axially movable therewith and laterally movable with respect thereto;

a series eccentric mechanism for each of said pistons, including a first cylindrical eccentric body mounted eccentrically on said driveshaft with an eccentricity of e_1 and rotatable therewith; and a second cylindrical eccentric body mounted eccentrically on said first eccentric body



within said ring with an eccentricity of e_2 and rotatable with respect to said ring and said first eccentric body;

means for changing the relative angular position of said first and second eccentric bodies;

whereby the degree of eccentricity contributed by said first and second eccentrics can be selectively added and subtracted to yield selected piston stroke valves between e_1+e_2 and the absolute value of e_1-e_2.

4,387,567

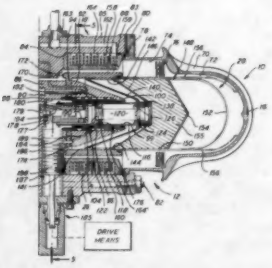
HEAT ENGINE DEVICE

Harlan V. White, El Dorado, Ill., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,714

Int. Cl.³ F02G *1/04*

U.S. Cl. 60—520 **25 Claims**



1. A free-piston Stirling engine having a vessel defining therein a working space; a power piston and a displacer having first and second ends, disposed in said working space for axial reciprocating movement therein; means for heating a working gas in one region of said vessel adjacent said first end of said displacer; and means for cooling the working gas in another region of said vessel adjacent said second end of said displacer to create a periodic pressure wave in the working gas; wherein the improvement comprises:

mounting means including a first portion fixed to said vessel and a second portion associated with the second end of said displacer for slidably supporting said displacer within said vessel;

said mounting means including an enclosed variable volume space containing a gas which functions as a gas spring biased axially between said displacer and said vessel;

means for introducing a non-linearity into said gas spring during operation thereof;

said mounting means causing the effective area of said displacer/exposed to said pressure wave to be smaller on the second end than on the first end of said displacer;

whereby said perodic pressure wave acting on said unequal end areas of said displacer, and said gas spring, constitute a spring-force system to maintain the reciprocating movement of said displacer.

4,387,568

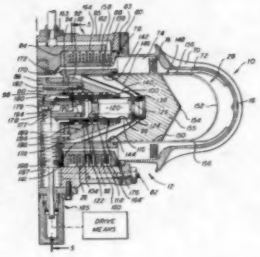
STIRLING ENGINE DISPLACER GAS BEARING

John J. Dineen, Durham, N.H., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,717

Int. Cl.³ F02G *1/04*

U.S. Cl. 60—520 **16 Claims**



1. A Stirling engine having a displacer movable axially in a pressure vessel for shuttling a working gas between a heater and a cooler through a regenerator for creating a pressure wave in the working gas for driving a power piston, wherein the improvement comprises:

means for mounting said displacer in said vessel including a first portion fixed to said vessel and a second portion associated with said displacer;

said first and second portions arranged coaxially adjacent and defining therebetween an annular gap;

a linear hydrostatic gas bearing disposed in said gap for slidably supporting said portion relative to said first portion;

a source of working gas pressure for pressurizing said gas bearing;

high pressure gas plenum means for pressurizing said gas bearing and connected to said source; and

low pressure gas plenum means for draining said gas bearing.

4,387,569

HYDRAULIC BRAKE BOOSTER

Donald M. Flory, Arcanum, and Denny L. Peeples, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 6, 1980, Ser. No. 204,464

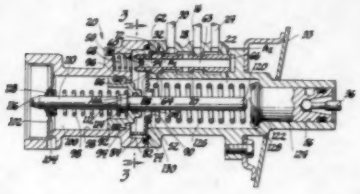
Int. Cl.³ B60T *13/12*

U.S. Cl. 60—548 **3 Claims**

1. In a hydraulic booster having a housing, an input and reaction piston and a power piston forming portions of walls of a power chamber formed in the housing, a control valve in a control valve chamber formed in the housing, the control valve being hydraulically unbalanced toward the booster release position of control and also being continuously urged toward the booster release position of control by a valve spring, a power piston return spring continuously urging the power piston toward the input and reaction piston, and a con-

trol lever operatively engaging the control valve and the input and reaction piston, said improvement comprising:

said control lever having one end in the power chamber and the other end pivotally connected to the control valve and an intermediate portion which when the booster is released engages a shoulder formed on the booster housing between the power chamber and the valve chamber, said control lever one end forming a pivot engaged in pivotal relation with a fixed pivot point on the housing, and a reaction compression spring in the power chamber having one end acting directly on said control lever intermediate



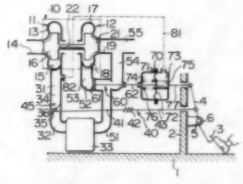
said lever ends and the other end acting on said input and reaction piston so that booster actuating movement of the input and reaction piston toward the power piston transmits force through said reaction spring assuring engagement of said control lever one end pivot with said fixed pivot point and thereafter causes pivoting movement of the control lever about said fixed pivot point to move said control lever other end and said control valve in a booster actuating direction to permit hydraulic pressure to pressurize the power chamber, the pressure fluid in the power chamber acting to move the power piston and also acting on the input and reaction piston to provide feedback.

4,387,570

INTERNAL COMBUSTION ENGINE WITH SUPERCHARGER

Kenji Iwamoto, Nishio, and Makoto Kuroyanagi, Hekinan, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 9, 1981, Ser. No. 232,968
Claims priority, application Japan, Feb. 13, 1980, 55-16986
Int. Cl.³ F02D *23/00*
U.S. Cl. 60—600 **7 Claims**



1. An internal combustion engine for use in a vehicle having an acceleration pedal movable to take a non-load position, predetermined intermediate-load position and full-load position, comprising:

a supercharger;

an intake system including an intake passage having one end thereof connected to said supercharger and other end connected to the engine for introducing fluid thereinto, and a throttle valve within said intake passage and movable for controlling flow rate of the fluid introduced into the engine through said intake passage;

means for interlocking said acceleration pedal and said throttle valve with each other to move said throttle valve between an idle position when said acceleration pedal is in said non-load position and a full-open position when said acceleration pedal is in said predetermined intermediate-load position;

means for holding said throttle valve in said full-open position when said acceleration pedal is between said predetermined intermediate-load position and said full-load position; and

control means interlocked with said acceleration pedal for controlling the operation of said supercharger so as to cause the same to perform its supercharging only when said acceleration pedal is between said predetermined intermediate-load position and said full-load position,

wherein said supercharger includes a compressor having inlet and outlet, said one end of said intake passage being connected to said outlet of said compressor, and turbine drivingly connected to said compressor, said turbine having an outlet communicating with the engine and being driven by exhaust gas therefrom,

further comprising an exhaust system including an exhaust passage having one end thereof connected to the engine and the other end connected to said inlet of said turbine, and a bypass passage bypassing said turbine and having one end opening to said exhaust passage and the other end communicating with atmosphere, said control means including a control valve in said exhaust passage and movable between a first position where said exhaust passage is closed and said bypass passage is opened and a second position where said exhaust passage is opened and said bypass passage is closed, and second interlocking means for interlocking said acceleration pedal and said control valve with each other to move the latter into said first position when said acceleration pedal is between said non-load position and said predetermined intermediate-load position and into said second position when said acceleration pedal is between said predetermined intermediate-load position and said full-load position,

wherein said control means includes means for sensing the discharge pressure of said compressor to produce a signal when the discharge pressure is higher than a predetermined value, an actuator operative in response to the signal from said sensing means, when said acceleration pedal is between said full-load position and said predetermined intermediate-load position, to actuate said control valve for moving the same between said first and second positions to adjust flow rate of exhaust gas directed toward said turbine, and

wherein said actuator includes a housing connected to said second interlocking means, a diaphragm within said housing to define therein a pressure chamber and an atmospheric chamber, said control valve being connected to said diaphragm, said sensing means including a port opening to a portion of said intake passage between said outlet of said compressor and said throttle valve, said control means further including a conduit having one end thereof connected to said port and the other end connected to said pressure chamber for introducing the discharge pressure of said compressor into said pressure chamber.

4,387,571

KNOCK CONTROL SYSTEM AND METHOD FOR TURBOSUPERCHARGER INSTALLED ENGINES

Masaaki Katsumata, Yokohama, and Kenji Yoneda, Fujisawa, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

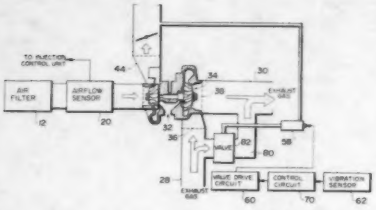
Filed Jul. 29, 1980, Ser. No. 173,433
Claims priority, application Japan, Jul. 30, 1979, 54-96934
Int. Cl.³ F02B *37/12*
U.S. Cl. 60—602 **9 Claims**

1. A knock control system for use in an internal combustion engine equipped with a supercharger for applying supercharge to said engine, comprising:

(a) first means for detecting the frequency of occurrence of knock in said engine;

(b) second means for varying the degree of supercharge applied to said engine; and

(c) third means for controlling said second means to vary the degree of supercharge in accordance with the detected frequency of occurrence of knock.



8. A method for controlling knock in an internal combustion engine having a supercharger for applying supercharge to the engine, comprising the steps of detecting the frequency of occurrence of knock in the engine and varying the degree of supercharge applied to the engine in response to the detected frequency of occurrence of knock.

4,387,572

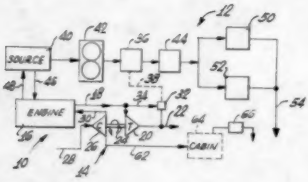
TURBOCHARGER CONTROL SYSTEM

Neil R. Richardson, Palos Verdes Estates, and Bradley A. Woodhull, Fullerton, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed May 7, 1981, Ser. No. 261,585

Int. Cl.³ F02B *37/12*

U.S. Cl. 60—602 **35 Claims**



1. In an engine system having an engine and a compressor for supplying charge air to the engine, a system for controlling compressor operation, comprising:

valve means for controlling operation of the compressor to control the pressure level of the charge air supplied by the compressor;

first controller means responsive to engine power setting above a predetermined low power setting for controlling the position of said valve means in response to engine power setting;

second controller means for modulating the position of said valve means in response to variations in altitude during engine operation at said low power setting for controlling the compressor to provide charge air having a pressure according to a first functional relationship with altitude up to a predetermined altitude; and

third controller means for modulating the position of said valve means in response to variations in altitude above said predetermined altitude during engine operation at said low power setting for controlling the compressor to provide charge air having a pressure according to a second functional relationship with altitude.

4,387,573

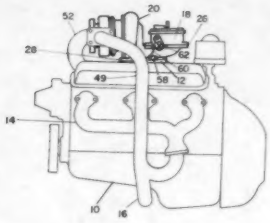
TURBOCHARGER MODULE FOR INTERNAL COMBUSTION ENGINE

Martin G. Parker, 4865 Pasadena Ave., Sacramento, Calif. 95841

Filed Dec. 11, 1980, Ser. No. 215,506

Int. Cl.³ F02B *33/44*

U.S. Cl. 60—611 **2 Claims**



1. A turbocharger for an internal combustion engine comprising:

a one-piece housing;

an upwardly directed intake port and a downwardly directed discharge surface in said housing;

first and second standard carburetor flanges around said intake port and discharge surface, respectively, so that a carburetor may be mounted directly thereon to feed an air/fuel mixture therein, and said housing may be mounted on the intake manifold of an internal combustion engine to discharge therein;

means in said housing forming a flow passage extending downward from said intake port in the configuration of a U-trap terminating in a horizontal outlet duct opening through one end of said housing;

a compressor delivery passageway in said housing extending upward from said outlet duct and then around it to a bottom port opening through said discharge surface;

a wall closure on said one end of the housing;

a horizontal shaft rotatable in said wall;

a turbine compressor on said shaft on the inside of said wall and disposed coaxially within said horizontal outlet duct;

a turbine impeller on said shaft on the outside of said wall;

a turbine housing on the outside of said wall and containing said impeller;

an inlet port in said turbine housing adapted to be connected to the exhaust manifold of an internal combustion engine;

a bypass port in said housing opening from the lowest level of said U-trap flow passage through said discharge surface;

a shut-off valve in said bypass port; and

means operative to open said shut-off valve at low engine loads.

4,387,574

SOLAR POWER PLANT INCLUDING A SOLAR HEATER ON A TOWER

Bernard Becker, Mülheim; Roland Meyer-Pittroff, Eckental, and Günter Fröhlich, Mülheim, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Fed. Rep. of Germany

Filed Apr. 28, 1981, Ser. No. 258,369

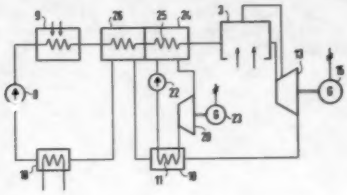
Claims priority, application Fed. Rep. of Germany, May 8, 1980, 3017699

Int. Cl.³ F03G *7/02*

U.S. Cl. 60—641.11 **8 Claims**

1. Solar power plant, comprising a tower, a solar heater disposed on said tower, a plurality of reflectors disposed in a given area for irradiating said solar heater, a water-steam circuit connected to said solar heater for conducting working

medium thereto, a steam turbine connected in said water-steam circuit, a preheater for the working medium in the form of additional sunlight collectors being disposed outside of said given area and being connected to said water-steam circuit



upstream of said solar heater, and means for adjusting the pressure in said water-steam circuit to cause the pressure of the steam in said solar heater to approximate the atmospheric air pressure outside.

4,387,575

POWER STATION

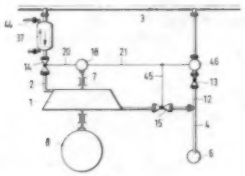
Joachim O. M. Wenzel, Hauptmannsreute 46, 7 Stuttgart 1, Fed. Rep. of Germany

Division of Ser. No. 822,982, Aug. 8, 1977, Pat. No. 4,220,009. This application Jun. 30, 1980, Ser. No. 164,203

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1977, 2702232; Feb. 17, 1977, 2706702; Mar. 2, 1977, 2709036; Jun. 24, 1977, 2728418

Int. Cl.³ F01K *25/10*

U.S. Cl. 60—648 **9 Claims**



1. A method, of supplying a fluid pressure medium from a supply pipe through a delivery pipe to a utilising device, which comprises the steps of:

(i) determining the output of a prime mover connected through shut-off valve means to said delivery pipe

(ii) closing said shut-off valve means and opening a pressure-reducing valve means in a by-pass pipe connected between said main supply pipe and said delivery pipe, when said output falls below a predetermined rate

(iii) determining the rate of flow of the fluid pressure medium in said by-pass pipe

(iv) when the rate of flow of the fluid pressure medium in said by-pass pipe exceeds a predetermined rate, closing said pressure-reducing valve and opening said shut-off valve means.

4,387,576

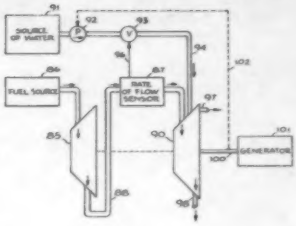
TWO-PHASE THERMAL ENERGY CONVERSION SYSTEM

Lawrence E. Bissell, 1242 26th St., Apt. B, Santa Monica, Calif. 90404

Division of Ser. No. 899,791, Apr. 25, 1978, Pat. No. 4,249,385, which is a continuation-in-part of Ser. No. 615,931, Sep. 23, 1975, Pat. No. 4,085,591. This application Nov. 10, 1980, Ser. No. 205,635

Int. Cl.³ F01K *21/04*

U.S. Cl. 60—649 **4 Claims**



1. A two-phase thermal energy conversion system comprising:

(a) a source of hot gas;

(b) a vapor turbine connected to the source;

(c) a rate of flow sensor disposed in the connection between said gas source and said vapor turbine;

(d) a source of water;

(e) a pump connected to said source of water;

(f) a controllable valve connected between said pump and said vapor turbine for feeding a controlled amount of water into said vapor turbine; and

(g) means for coupling said rate of flow sensor to said controllable valve for controlling the volume of water fed into said vapor turbine in accordance with the rate of flow of gas to the vapor turbine, whereby the hot gases are mixed with water in a selected proportion to develop substantially optimum condensation of water vapor in the exhaust of said vapor turbine.

4,387,577

BOILERS

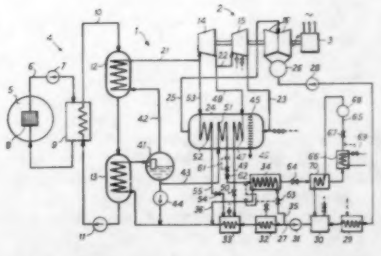
John W. E. Campbell, Maidenhead, England, assignor to Babcock Power Limited, London, England

Filed Aug. 14, 1980, Ser. No. 177,907

Claims priority, application United Kingdom, Aug. 16, 1979, 7928666

Int. Cl.³ F01K *7/22*

U.S. Cl. 60—680 **12 Claims**



1. A forced-flow boiler for a power plant that comprises a main circuit for steam/water working fluid which includes

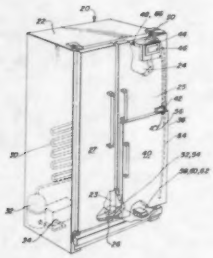
boiler feedwater heating means, boiler steam generating means, a steam-driven prime mover stage, boiler steam reheating means, a lower-pressure steam-driven prime mover stage, a boiler steam condenser and pumping means for driving the working fluid around the circuit, the boiler including a boiler water letdown sub-circuit including means for continuously separating unevaporated water from the boiler working fluid leaving the boiler steam generating means, means for continuously treating the letdown water and means for allowing the treated letdown water continuously to join feedwater in the main circuit, wherein the said boiler steam reheating means includes a heat exchanger arranged for continuously transferring heat from the letdown water to the steam to be reheated.

4,387,578

ELECTRONIC SENSING AND DISPLAY SYSTEM FOR A REFRIGERATOR

Stephen W. Paddock, Knight Township, Vanderburgh County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 20, 1981, Ser. No. 255,673
Int. Cl.³ F25B *49/00*; G05D *23/00*
U.S. Cl. 62—127 **15 Claims**



1. In a refrigeration apparatus having means defining a refrigerated space and cooling means for cooling the air within said refrigerated space, a sensing and display system comprising:

a plurality of sensors connected to said refrigeration apparatus, each of said sensors arranged to provide an output signal to indicate the existence of a sensed operating condition of said apparatus;

a first series of electrical indicators;

a second series of electrical indicators, at least one indicator of said second series of indicators corresponding to each of said sensed operating conditions; and,

electronic signal processing means coupled to said sensors and to said first and second series of indicators, including

means for effecting repetitive sequential energization of said first series of indicators during periods when said sensors indicate that none of said predetermined sensed operating conditions exist; and,

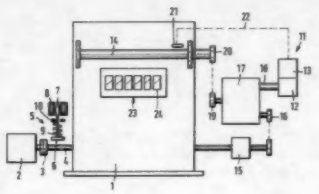
means for terminating sequential energization of said first series of indicators and energizing one of said second series of indicators when one of said sensors indicates the existence of one of said sensed operating conditions.

4,387,579

BRAKE FOR A WARP KNITTING MACHINE

Walter Branke, Rodgau, and Karl Winter, Obertshausen, both of Fed. Rep. of Germany, assignors to Karly Mayer Textilmaschinenfabrik GmbH, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,080
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3025782
Int. Cl.³ D04B *35/10*
U.S. Cl. 66—157 **8 Claims**



1. A warp knitting machine having a main shaft driven by an electric motor powered by a main circuit, further comprising:

(a) at least one supplemental, electrically driven regulating motor for influencing the thread takeoff of said machine, said electrically driven regulating motor being connected to said main circuit; and

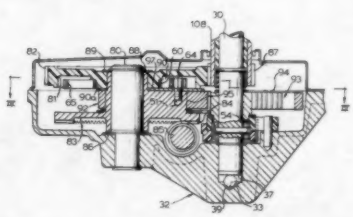
(b) electrically operable brake means coupled to said main circuit operable upon said main shaft for braking in response to interruption of said main circuit.

4,387,580

AUTOMATIC WASHER ENERGY ABSORBING SPIN DELAY MECHANISM

William L. Kennedy, Coloma Township, Berrien County, and Richard L. Fanson, St. Joseph Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbon, Mich.

Filed Dec. 19, 1980, Ser. No. 218,039
Int. Cl.³ D06F *37/40*
U.S. Cl. 68—12 R **7 Claims**



5. In an automatic laundry appliance being a clothes washer of the type including first and second drive means having a cycle of operation controlled by a presettable sequential control means and a delay means for delaying coupling of said second drive means until said first drive means is completely decoupled, the improvement of,

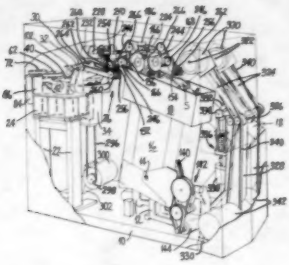
a driver comprising a generally circular shaped open loop made of resilient material and having an eye formed at one end thereof for pivotal mounting on a stud formed on a main drive gear and having an offset shoulder formed at the opposite end thereof providing an abutment surface means for selective engagement with a driven spin gear of said second drive means,

said driver operating to engage said main drive gear and said driven gear with a cushioning action to absorb stress and reduce noise.

4,387,581
MACHINE ADAPTED FOR USE IN THE MANUFACTURE OF SHOES

David C. Reedman, Melton Mowbray, and Kingsley J. Tutt, Birstall, both of England, assignors to USM Corporation, Farmington, Conn.

Filed Jun. 5, 1981, Ser. No. 270,801
Claims priority, application United Kingdom, Jun. 10, 1980, 8019008
Int. Cl.³ C14B *1/44*
U.S. Cl. 69—6.5 6 Claims



1. A machine for performing a roughing operation progressively along marginal portions of shoe bottoms, comprising

a shoe support for supporting a lasted shoe, bottom uppermost,

tool supporting means comprising a support on which a sub-frame is mounted for pivotal movement about a transverse axis, a radial roughing tool being supported on said sub-frame with the transverse axis extending tangential, or substantially tangential, to the shoe bottom engaging region of the operating surface thereof,

first, second and third stepping motors for effecting relative movement, respectively lengthwise, widthwise and heightwise of the bottom of a shoe supported by the shoe support, between the shoe support and said support forming part of the tool supporting means,

computer control means by which drive signals are generated and supplied to said stepping motors in accordance with a programmed instruction, including digitised co-ordinate axis values, using three co-ordinate axes, for a plurality of selected points along marginal portions of the bottom of the or a similar shoe, whereby the tool is caused to follow a pre-determined path in relation to the shoe bottom being operated upon, and

a fourth stepping motor for effecting pivotal movement of the sub-frame about said transverse axis in response to drive signals supplied thereto by the computer control means in accordance with said programmed instruction, whereby, as the tool operates as aforesaid, the plane in which its operating surface lies is maintained normal, or substantially normal, to the marginal portion of the shoe bottom.

4,387,582
KEY OPERATED LOCK FOR SECURING A MOVABLE PORTION OF A MOTOR VEHICLE

Pierre Meunier, Plaisir, France, assignor to Sodex-Magister, Croissy, France

Filed Oct. 28, 1980, Ser. No. 201,101
Claims priority, application France, Jan. 14, 1980, 80 00683
Int. Cl.³ E05B *65/12*
U.S. Cl. 70—186 2 Claims

1. An anti-theft device for a motor vehicle comprising:

(a) a housing,

(b) means for securing said housing to a relatively fixed part of the vehicle,

(c) a locking bolt movable along a first axis between a locking position where said bolt engages an aperture in a movable portion of the vehicle to be locked and an unlocked position,

(d) a driving pin extending from said locking bolt,

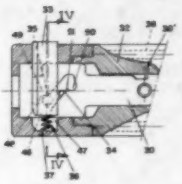
(e) a driving plate slidable along a second axis transverse to said first axis, said driving plate having a slot receiving said driving pin, which slot includes

(i) a first portion inclined to said first axis,

(ii) a second portion contiguous with one end of said first portion extending generally transversely of said first axis, and

(iii) a third portion contiguous with the other end of said first portion extending parallel to said first axis,

(f) a cylinder lock rotatable by means of a key within a bore



in the housing for effecting movement of said bolt between locking and unlocking positions,

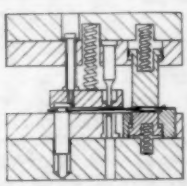
(g) a cam fixed to said cylinder lock so as to be rotatable thereby, said cam being in driving engagement with said driving plate, whereby on rotation of said cylinder lock the cam effects movement of said driving plate which in turn by way of the first portion of the slot causes said locking bolt to be driven into its locking position, and

(h) a return spring for urging said driving plate in opposition to its displacement by the cam wherein, due to the second portion of the slot no withdrawal of the locking bolt from its locking position is possible and due to the third portion of the slot movement of said bolt into a fully retracted position without movement of said driving plate for the purpose of assembly of the cylinder is possible.

4,387,583
BENDING AND FORMING TOOL

Earl C. Martin, Dayton; John K. Thompson, West Carrollton, and Robert J. Gargrave, Dayton, all of Ohio, assignors to Ready Systems, Inc., Dayton, Ohio

Filed Aug. 18, 1980, Ser. No. 179,264
Int. Cl.³ B21D *5/01*
U.S. Cl. 72—22 24 Claims



21. Bending and forming apparatus comprising an anvil adapted for use in a press in conjunction with a die connected to an opposed portion of the press to form and bend material interposed therebetween as the press closes during its cyclic operation, said anvil being adapted for connection to a base surface and including a plurality of coaxially related elements which are normally fixed to form an extension of one another by locking means internally embodied therein to normally provide them as a rigid unitized structure of substantially fixed length, said coaxially related elements including an inner and

an outer of said elements, said inner of said elements normally projecting outwardly from the outer thereof and mounting an anvil shoe which is peripherally extended, said locking means being constructed and arranged to be released to free said normally fixed coaxially related elements from one another to permit movement of one thereof relative the other, subsequent to application of load thereon, to convert said anvil to hard tooling of reduced length to set the bent and formed configuration of the material worked and said shoe being arranged to bottom on the adjacent extremity of the outer of said elements on release of said locking means.

4,387,584

STEEL PIPE ROLLING MILL

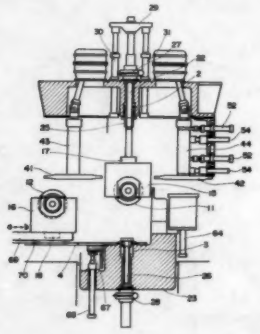
Shinji Akita, and Masayuki Hatanaka, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1981, Ser. No. 312,947

Claims priority, application Japan, Oct. 21, 1980, 55-146260; Oct. 31, 1980, 55-152143

Int. Cl.³ B21B *31/08*

U.S. Cl. 72—100 **8 Claims**



1. In a steel pipe rolling mill of the type including a housing, a top and bottom rolling roll, a top and bottom cradle for respectively holding said top and bottom rolling rolls, and a pair of disk shoes, the improvement comprising:

means for raising and lowering said top and bottom cradles; and

a carriage arranged below said bottom cradle and movable transversely,

whereby said top and bottom cradles are successively moved in and out of said housing transversely by said carriage.

4,387,585

SPRING COILING MACHINE WITH IMPROVED COIL STARTER MEANS

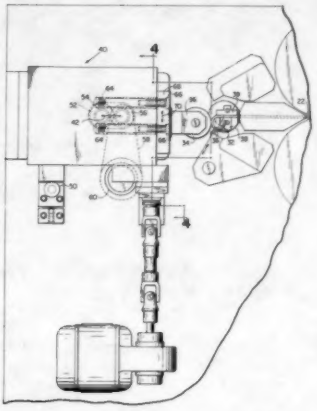
Erman V. Cavagnero, and Stanley M. Waligura, both of Torrington, Conn., assignors to Torin Corporation, Torrington, Conn.

Filed Jan. 13, 1981, Ser. No. 224,813

Int. Cl.³ B21F *3/04, 3/10, 11/00*

U.S. Cl. 72—131 **10 Claims**

1. In a cyclically operable spring coiling machine having a frame and coiling station; the combination of at least one pair of oppositely rotatable feed rolls on said frame for intermittently advancing wire longitudinally to the coiling station, a main drive means for said feed rolls, a relatively fixed coiling arbor at the coiling station, at least one coiling tool at the coiling station arranged to engage the longitudinally advancing wire to obstruct the linear movement thereof whereby progressively to bend the same about the coiling arbor and impart a coiling stress thereto resulting in the formation of a coil spring configuration at a leading end portion thereof, a cut-off tool at said coiling station operable by said main drive means successively to sever coiled leading end portions of the wire whereby to provide individual coil springs, a diameter slide movable by said main drive means longitudinally toward and away from said coiling arbor generally along the line of wire feeding movement but on the side of said arbor opposite said feed rolls, a coil starter slide mounted on said diameter slide adjacent said coiling arbor and movable in one and an opposite direction laterally along a line of movement approximately at right angles to the diameter slide movement and wire feed movement, said coil starter slide carrying said coiling tool,



a small coil starter motor independent of said main drive means mounted on the machine frame, and power transmitting means including universal joint means connected between said coil starter motor and said coil starter slide and operable by said motor to move said coil starter slide and coiling tool between operative wire coiling and coil starting positions, said latter position being spaced laterally from said coiling arbor to allow a short leading end portion of wire to be coiled to project beyond the arbor and to be thereafter engaged by the coiling tool and bent about the arbor for a coil starting operation on lateral movement of the coil starter slide and coiling tool from said starting position to said operative coiling position.

4,387,586

METHOD OF WIDTHWISE ROLLING OF ROLLED MATERIAL AND APPARATUS THEREFOR

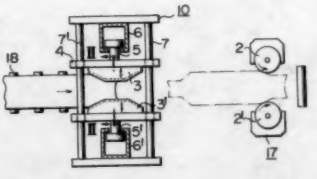
Hiroshi Awazuhara, Katsuta; Sukebumi Tsumura, Mito, and Tomoaki Kimura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 24, 1980, Ser. No. 200,606

Claims priority, application Japan, Oct. 31, 1979, 54-139929

Int. Cl.³ B21B *15/00, 47/00*

U.S. Cl. 72—206 **15 Claims**



1. A method of rolling a rolled material widthwise thereof, comprising the steps of:

shaping a lengthwise end portion of the rolled material by compression working to form therein a progressively reducing width portion in which the width is progressively reduced in going toward the end of the rolled material, and a uniform width portion contiguous with the progressively reducing width portion and having a width equal to the minimum width of the progressively reducing width portion between its end contiguous with the progressively reducing width portion and the end of the rolled material, in such a manner that said uniform width portion has a length at least over ½ the width of the rolled material before having its end portion shaped; and

thereafter rolling the rolled material widthwise thereof.

4,387,587

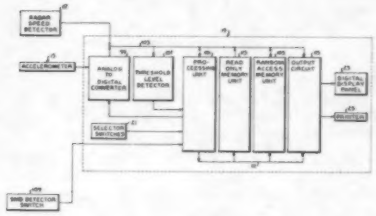
MOTOR VEHICLE DECELERATION DATA ACQUISITION AND PROCESSING APPARATUS AND METHODOLOGY

Boyd M. Faulconer, R.R. #1, Smithville, Mo. 64089

Filed Jun. 17, 1981, Ser. No. 274,416

Int. Cl.³ G01N *19/02*

U.S. Cl. 73—9 **12 Claims**



8. A method for determining coefficient of friction of a surface relative to tires of a vehicle and related information, including the steps of:

(a) operating the vehicle on the surface;

(b) braking the vehicle on the surface such that the wheels of the vehicle are locked and not free to rotate until the vehicle is substantially stopped;

(c) positioning a deceleration determining mechanism in the vehicle so as to determine deceleration rates of the vehicle during braking along a path of motion of the vehicle;

(d) at least periodically sampling deceleration data as determined by the deceleration determining mechanism during braking; and

(e) performing mathematical operations on said data for determining the coefficient of friction and related information.

4,387,588

KNOCKING DETECTOR OF AN INTERNAL COMBUSTION ENGINE

Kiyokane Kaji, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 29, 1981, Ser. No. 258,574

Claims priority, application Japan, May 19, 1980, 55-68572[U]

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 **3 Claims**

1. A knocking detector of an internal combustion engine comprising:

a knocking sensor for detecting engine vibrations and generating an output signal related thereto;

an integration circuit for integrating said output signal;

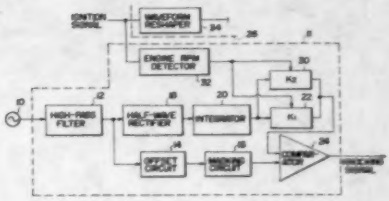
an engine rotation speed detection circuit for generating a speed signal when the engine rotates at a high speed;

an operational amplifier responsive to said integrated output signal;

a first feedback resistor connected between input and output terminals of said operational amplifier;

a second feedback resistor connected in parallel with said first feedback resistor;

a switching transistor having a collector and an emitter connected in series with said second feedback resistor, said switching transistor being responsive to said speed



signal to turn on said transistor when the engine rotates at a high speed to decrease the gain associated with said operational amplifier; and

a knocking detection circuit for comparing the output signal of said knocking sensor with an output signal of said operational amplifier to produce a knocking signal when the output signal of said knocking sensor exceeds the output signal of said operational amplifier.

4,387,589

TEST STAND

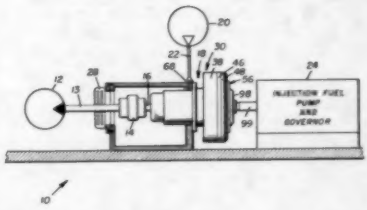
Larry A. Larson, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00780, § 371 Date Jun. 10, 1981, § 102(e) Date Jun. 10, 1981, PCT Pub. No. WO82/04481, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 10, 1981, Ser. No. 287,538

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A **8 Claims**



1. In a test stand (10) which has a drive shaft (16), the improvement comprising:

an inertial weight (30);

bearing means (34,36,52,54,55,26) for rotatively mounting said inertial weight (30) about said drive shaft (16); and

means (56) for at least selectively disengaging the inertial weight (30) from the drive shaft (16) while said drive shaft (16) is turning wherein said means (56) includes a bellows (58), located about said drive shaft (16), and a plurality of drive shaft engaging members (60) connected to said bellows (58).

4,387,590

SWATCH REMOVER AND METHOD

William J. Alexander, III, 41 W. Golden Strip Dr., Mauldin, S.C. 29662

Filed Jun. 2, 1981, Ser. No. 269,678

Int. Cl.³ G01N *1/04*

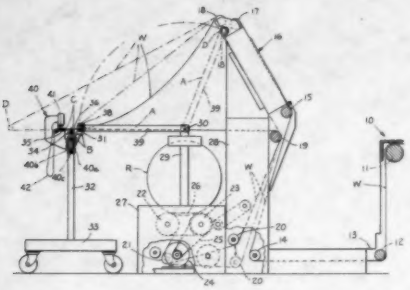
U.S. Cl. 73—159 **4 Claims**

1. For use with a cloth winder and the like, a swatch removing apparatus comprising:

an upright transverse frame member pivoted outboard of

said winder adjacent each end thereof having a bridging member adjacent the top over which cloth passes in open width to said winder;

means limiting downward pivoted movement of said transverse frame member for receiving cloth, a length of which has been pulled outwardly of a path to said winder by



movement of said bridging member as a result of downward pivotal movement of said frame for removal as a swatch; and

means for positioning said cloth for joining ends of cloth resulting from removal of the swatch together after removal of the swatch.

4,387,591

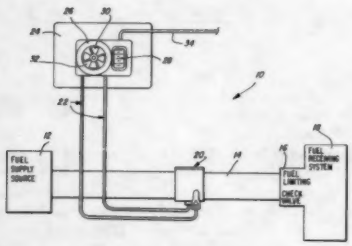
METHOD FOR TESTING FLUID CONTROL VALVES

Gerald G. Corzine, Hazelwood, and Charles E. Hagar, Augusta, both of Mo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 22, 1981, Ser. No. 256,327

Int. Cl.³ G01F *25/00*; G01M *19/00*

U.S. Cl. 73—168 **1 Claim**



1. A method for determining the operable condition of a fluid level control valve of a fluid receiving system prior to delivery of the fluid through a conduit to a fluid receiving system from a fluid supply source comprising the steps of:

delivering from the fluid supply source a test sample of fluid through the conduit, and

simultaneously determining the flow of the test sample of fluid through the conduit and the pressure of the test sample of fluid in the conduit, the simultaneous indication of fluid flow and fluid pressure within respective predetermined limits determining that the fluid level control valve is not properly operable.

4,387,592

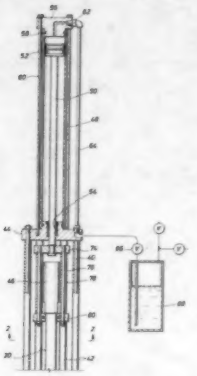
PROBE INSERTION APPARATUS

Robert H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Jul. 1, 1981, Ser. No. 279,429

Int. Cl.³ G01F *15/18*

U.S. Cl. 73—198 **9 Claims**



1. An apparatus for mounting an elongate sensor means for insertion into and removal from a pipeline against the pressure acting in the pipeline which apparatus is adapted to connect to the pipeline at a tee on the pipeline and which comprises:

(a) an elongate cylinder having a lower end and adapted to be positioned approximately perpendicular to the axis of a pipeline;

(b) a piston slidably positioned in said cylinder;

(c) means for mounting said cylinder aligned with and above said tee in the pipeline;

(d) a piston rod connected to said piston and extending from said cylinder toward the tee for reciprocation by said piston;

(e) elongate connector means having an exposed portion and also joining said piston rod to said sensor means and aligned therewith at one end thereof which end is inserted into and removed from the pipeline by operation of said piston moving in said cylinder said connector means being adapted to facilitate installation and operation of said sensor means;

(f) a flanged plate joinable to the tee and including seal means adjacent an opening therein, said seal means an opening defining a passage enabling said sensor means to be inserted through the tee and into the pipeline wherein a portion of said sensor means extends from the opening for cooperation with said connector means; and

(g) an open frame member connected between the lower end of said elongate cylinder and said flanged plate, said open frame member aligning said connector means for exposed insertion movement thereof toward said flanged plate.

4,387,593

POWDER LEVEL MEASUREMENT PROBE

Merlin H. Moseman, Omaha, Nebr., assignor to InterNorth, Inc., Omaha, Nebr.

Filed Feb. 19, 1981, Ser. No. 235,851

Int. Cl.³ G08B *21/00*

U.S. Cl. 73—290 R **6 Claims**

1. In combination,

a polypropylene gas phase reactor having an upper end and adapted to contain polypropylene powder therein,

a rigid hollow tube means extending downwardly into said reactor from the upper end thereof,

a powder probe holder mounted on the lower end of said hollow tube means and having upper and lower ends,

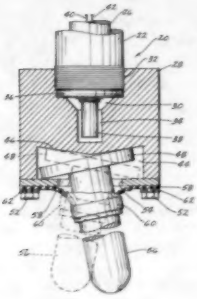
said holder having a cylindrical recess formed in its upper end,

a metal proximity sensor element in said cylindrical recess in said holder and being operatively connected to a signal device remotely from said reactor,

said holder having a recessed area formed in its lower end spaced below said cylindrical recess and positioned below said sensor element,

a metal plate means vertically movable mounted and pivotally movably mounted in said recessed area,

and a rigid powder probe rigidly connected to said plate



means and extending downwardly therefrom for contact with the powder in the reactor,

said metal plate means being either vertically moved or pivotally moved towards said sensor element, to activate the same, when the powder in said reactor sufficiently moves said probe with respect to said holder,

said recessed area having a circular cross-section and said plate means is disc-shaped and has a smaller diameter than said recessed area; and

a support ring secured to the lower end of said holder below said plate means to maintain said plate means in said recessed area, said support ring having a central opening smaller in diameter than said plate means and said probe extending downwardly through said support ring.

4,387,594

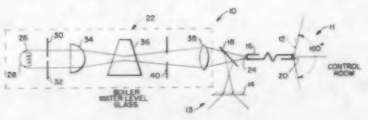
WATER LEVEL INDICATOR HAVING A REMOTE AND A LOCAL READOUT DISPLAY

John Berthold, Salem, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 23, 1981, Ser. No. 245,871

Int. Cl.³ G01F *23/00*; G02B *27/14*

U.S. Cl. 73—293 **4 Claims**



1. A liquid level gauge assembly for providing a remote and a local optical display of the liquid level in a boiler comprising:

optical means mounted proximately to the boiler for producing an optical signal indicative of liquid level in the boiler;

a beam splitter located proximate to said optical means to divide the optical liquid level signal of said optical means into a first and second optical signal;

a fibre optic cable having one end located proximately to said beam splitter and being used to transmit said first optical signal from said beam splitter to a boiler control location remote from said beam splitter and the boiler; and

display means located proximately to said beam splitter to display said second optical signal from said beam splitter in the area of the boiler.

4,387,595

FLOAT OF SLURRY PRESSURE FEEDING SYSTEM

Masakatsu Sakamoto, Matsudo; Kenji Uchida, and Shuichi Nagano, both of Kashiwa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 3, 1981, Ser. No. 250,665

Claims priority, application Japan, Apr. 9, 1980, 55-45590

Int. Cl.³ G01F *23/06*

U.S. Cl. 73—322.5 **10 Claims**

8. A system for pressure feeding of slurry comprising at least one slurry supply chamber provided with a float, the slurry supply chamber being in flow communication with means for delivering a charge of slurry under low pressure to said slurry supply chamber and means for feeding said slurry by a driving liquid under high pressure from said slurry supply chamber to a desired destination, wherein said float comprises:

a float body which has a bellows portion and which encloses a volume, wherein said volume contains a gas and a liquid sealed in said float body, said gas and liquid being sealed in said float body to occupy volume portions of said volume such that the total weight per total volume of the float changes according to the pressure of the driving liquid and slurry.

4,387,596

METHOD OF AND DEVICE FOR ULTRASONICALLY TESTING SPHERICAL BODIES

Max Fenkner, Schweinfurt, and Hilmar Wehner, Schwebheim, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Feb. 2, 1981, Ser. No. 231,217

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1980, 3004079

Int. Cl.³ G01N *29/00*; G01M *13/00*; G01H *1/00*

U.S. Cl. 73—593 **4 Claims**

1. A device for ultrasonically testing spherical bodies, comprising:

a supporting member with a spherically concave recess accommodating a body to be tested;

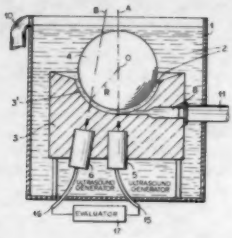
a supply of coupling liquid communicating with said recess for providing a cushion of said liquid between said member and a body seated in said recess;

first ultrasound-generating means trained vertically from below through said member and said cushion upon the center of curvature of said recess;

second ultrasound-generating means trained inclinedly from the vertical at an angle less than 90° from below through said member and said cushion upon a body seated in said recess along at least one line offset from said center of curvature;

drive means for setting a body to be tested in successive

rotation about at least two different axes substantially passing through said center of curvature; and



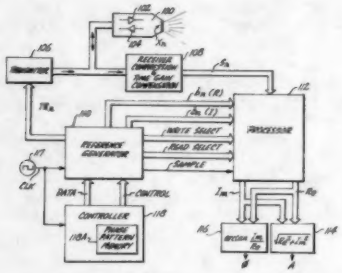
evaluating means connected to said first and second ultrasound-generating means.

4,387,597

BEAMFORMING APPARATUS AND METHOD FOR ULTRASONIC IMAGING SYSTEMS

Marco A. Brandestini, Seattle, Wash., assignor to Advanced Technology Laboratories, Inc., Bellevue, Wash.

Filed Dec. 8, 1980, Ser. No. 214,422
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—626 **25 Claims**



1. A method for steering and focusing the received beam of an array of ultrasonic transducers to an incremental portion of an object, each transducer being adapted to provide a received signal representing returns of ultrasonic energy from object points of the object, said method comprising the steps of:

providing a plurality of first reference signals, each first reference signal being associated with one of the received signals and having a frequency and phase that are matched to the frequency and phase of those components in the associated received signal that represent returns from object points within said incremental portion;

multiplying each received signal by its associated first reference signal so as to develop a plurality of first product signals each related to the product of a received signal and its associated first reference signal;

integrating each of said plurality of first product signals during an associated one of a plurality of resolution windows, the time occurrence of each said resolution window being substantially equal to the time occurrence of those components in the received signal, from which the associated said first product signal has been developed, that represent returns from object points within said incremental portion, so as to develop a plurality of first correlated signals each related to the time integral of at least one of said plurality of first product signals; and,

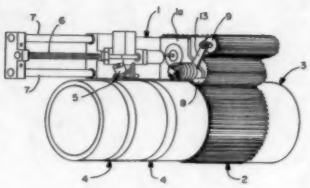
combining said plurality of first correlated signals so as to develop a first output signal representing a first response of the array to returns from object points within said incremental portion.

4,387,598

PIPE SCANNER MECHANISM

John M. Jamieson, Herndon, and Dixon Cleveland, Annandale, both of Va., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Sep. 15, 1981, Ser. No. 302,459
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—637 **2 Claims**



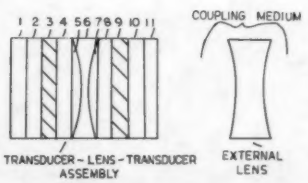
1. A device for total circumferential scanning of pipes and pipe joints comprising a housing accommodating a toothed drive roller, driving means connected to said toothed drive roller, a toothed idler roller and a plurality of smooth idler rollers, wherein at least one of said smooth idler rollers is connected to said housing by pivoting arms adapted for tensioning by spring means, and scanning means for detecting faults and imperfections in said pipes and pipe joints; said device further comprising a flexible belt toothed on one surface thereof and having a length greater than the circumference of the pipe to be scanned and having ends adapted to be securely joined together, said belt adapted to be routed circumferentially around said pipe and through said housing by contacting each of said rollers whereby the toothed surface of said belt contacts said toothed drive roller and toothed idler roller and the smooth surface of said belt contacts said pipe and said smooth idler rollers.

4,387,599

MULTIPLE FIELD ACOUSTIC FOCUSSER

Arthur Samodovitz, 67 Overbrook Dr., Colonia, N.J. 07067

Filed Jan. 6, 1981, Ser. No. 222,947
Int. Cl.³ G10K *11/30*
U.S. Cl. 73—642 **9 Claims**



1. An ultrasonic apparatus for focussing ultrasonic waves comprising the following acoustical lenses and transducing elements located in order along an axis:

a first acoustical lens,

a first transducing element,

a second acoustical lens, and

a second transducing element, and further comprising

means for coupling the first lens to the first transducing element, the first transducing element to the second lens, and the second lens to the second transducing element so that ultrasonic waves can propagate from the first lens, to

the first transducing element, to the second lens, and to the second transducing element.

4,387,600

FIBEROPTIC PRESSURE GAUGE

Max L. Kranz, La Habra, Calif., assignor to U.S.D. Corp, Santa Ana, Calif.

Filed Apr. 13, 1981, Ser. No. 253,361
Int. Cl.³ G01L 7/04
U.S. Cl. 73—714 **22 Claims**

1. A pressure gauge readout for sensing pressures within a body of breathing gas contained within a tank and displaying them comprising:

a pressure gauge readout head having a fitting thereon with an opening adapted for receipt of pressure from a tank of breathing gas;

a bourdon tube having an open end adapted for contact with the opening of said pressure head connection for receipt of pressure within said breathing gas tank;

light means within said pressure sensing head;

means attached to said bourdon tube for controlling the location of light emitted from said light means so that as said bourdon tube moves, said means for controlling the light location will correspond to said bourdon tube movement and analogous pressure within said breathing gas tank;

a plurality of discrete light conducting means in optical relationship to said light means for conducting light therefrom corresponding to the controlled location provided by said light controlling means; and,

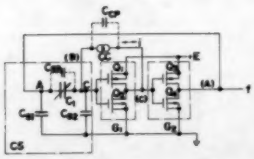
means attached to said light conducting means for indicating the amount of pressure corresponding to the location of light conducted therethrough.

4,387,601

CAPACITANCE TYPE DISPLACEMENT CONVERSION DEVICE

Tadashi Azegami, Inagi, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Jun. 19, 1981, Ser. No. 275,510
Claims priority, application Japan, Jul. 1, 1980, 55-89745; Jul. 24, 1980, 55-101699; Feb. 9, 1981, 56-18406; Feb. 9, 1981, 56-18407; Feb. 12, 1981, 56-19450; Mar. 30, 1981, 56-46738
Int. Cl.³ G01L 9/12
U.S. Cl. 73—724 **14 Claims**



1. A capacitance type displacement conversion device for measuring a physical displacement by converting a physical displacement detected by a capacitance type sensor into an electrical signal proportionate to the displacement comprising:

a sensor having a movable electrode plate responsive to a physical displacement and a stationary electrode plate, said sensor forming a capacitor having a capacitance value proportionate to the physical displacement to be measured,

an amplification means having an input and two outputs, one of which is in same phase with said input and the other in opposite phase with said input, one of said electrode plates being connected to said input and the other of said electrode plates being connected to said output which is in same phase with said input, and

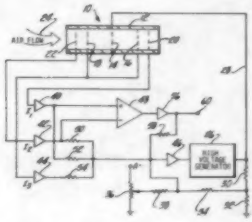
a constant current circuit connected between said input and said output which is in opposite phase with said input and allowing the constant current to flow in both directions.

4,387,602

PRESSURE COMPENSATED CIRCUIT FOR ION MASS AIRFLOW SENSORS

Binneg Y. Lao, Rancho Palos Verdes, Calif., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 4, 1981, Ser. No. 231,634
Int. Cl.³ G01F 1/64, 1/78
U.S. Cl. 73—861.09 **32 Claims**



1. A pressure compensated detection circuit for an ion mass flow sensor having at least one corona electrode generating ions by corona discharge and at least one ion collector electrode collecting the generated ions to produce at least two collected ion currents, said circuit comprising:

first means for generating a mass flow rate signal in response to the collected ion currents;

second means for generating a total ion current signal indicative of the total number of ions generated in response to said collected ion currents;

third means for generating a pressure compensation signal in response to said mass flow rate signal;

fourth means for summing said pressure compensation signal with said total ion current signal and a reference signal to generate a control signal; and

high voltage generator means for generating a high voltage signal applied to the sensor's corona electrode in response to said control signal, said high voltage signal having a value keeping the relationship of the total ion current to said pressure compensation signal and said reference signal a constant.

27. A method for pressure compensating the output of an ion mass flow rate sensor having at least one corona electrode producing ions by corona discharge and at least one ion collector collecting the generated ions to produce at least two ion currents, comprising the steps of:

amplifying the difference between said two ion currents to generate a mass flow rate signal;

amplifying the sum of said two ion currents to generate a total ion current signal;

generating a reference signal;

correcting said reference signal as a function of said mass

flow rate signal to generate a pressure compensated reference signal; and

summing said pressure compensated reference signal with said total ion input current signal to generate a control signal

controlling a high voltage generator with said control signal to generate a high voltage signal applied to the corona electrode, said high voltage signal activating said corona electrode to generate a corona discharge generating ions at a rate maintaining the relationship of the total ion current to the pressure compensated reference signal a constant.

4,387,603

BOUNCELESS HIGH PRESSURE DROP CASCADE IMPACTOR AND A METHOD FOR DETERMINING PARTICLE SIZE DISTRIBUTION OF AN AEROSOL

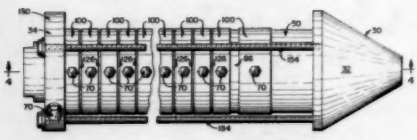
Philip A. Nelson, 326 Ranger Dr., Olympia, Wash. 98503

Continuation of Ser. No. 51,687, Jun. 25, 1979, Pat. No. 4,327,594, which is a continuation-in-part of Ser. No. 821,608, Aug. 3, 1977, Pat. No. 4,189,937, which is a continuation-in-part of Ser. No. 464,158, Apr. 25, 1974, abandoned. This application Sep. 28, 1981, Ser. No. 306,162

The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.

Int. Cl.³ G01N *15/02*

U.S. Cl. 73—863.22 **15 Claims**



1. A cascade impactor for sampling a particle-laden gas for particle size distribution, said impactor comprising:

a. a gas inlet and a gas outlet;

b. a plurality of stages between said gas inlet and said gas exit wherein each stage comprised a jet plate and a collector plate except that the first jet plate may be a part of or may be replaced by the inlet nozzle;

c. a collector plate downstream from each jet plate, and a jet plate upstream from each collector plate;

d. each jet plate having one or more apeture(s) through which the particle laden gas passes wherein said aperture(s) are positioned so that the gas from the jet plate is directed to the collector surface on the respective collector plate downstream from said jet, said aperture(s) being round holes, or rectangular slits, or curved slits;

e. each of said collector plates comprising the upstream surface of the succeeding jet plate and being intregal with said jet plate, except that the downstream-most collector plate will be separate from any jet plate;

f. appropriate sealing means between a jet plate and a collector plate or between adjacent jet-collector plates to cause the gas to flow entirely through the jet aperture(a) or through other designated passageways between a collector plate and succeedingly jet plate; and,

g. and wherein one or more of the jet plates have jet holes less than 0.10 inch in diameter or jet slits less than 0.10 inch in width, as the case may be, and in which the ratio of jet hole diameter to depth of the jet hole, that is the t/D ratio, is greater than 6, or in which the ratio of the jet slit width to jet slit depth, that is the t/Wi ratio, is greater than 6, as the case may be, and where t is defined as the depth of the cylindrical section of the jet hole(s) or t is defined as the depth of that (those) portion(s) of the slit(s) that have parallel sides, and for square-edged holes or slits t equals the thickness of the jet plate, and for holes or slits with rounded, countersunk, or chamfered edges, t is less than the thickness of the jet plate.

4,387,604

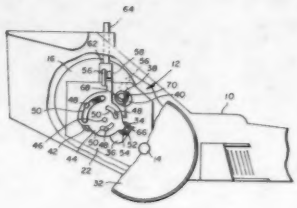
TOY INERTIA MOTOR

William M. Maher, Churchville, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 27, 1981, Ser. No. 228,779

Int. Cl.³ F16H *3/34*; A63H *17/00, 29/20*

U.S. Cl. 74—354 **9 Claims**



1. A toy inertia motor for driving a rotatable drive shaft comprising:

a rotatable flywheel for storing energy when rotated;

a rotatable drive shaft;

a winding gear train for coupling said drive shaft to said flywheel for rotating said flywheel at high speed upon rotation of said drive shaft in one direction by an applied force;

a driving gear train coupling said flywheel to said drive shaft for transmitting the energy of said rotating flywheel to said drive shaft for driving said drive shaft in said one direction;

a first gear of said winding and driving gear trains movable, in response to rotation of said drive shaft in said one direction, from a normal drive position, in which said first gear is a part of said driving gear train and disengaged from said winding gear train, to a wind position, in which said first gear is a part of said winding gear train and disengaged from said driving gear train;

latch means responsive to movement of said first gear to its wind position for latching said first gear in said wind position whereby rotation of said flywheel to a high speed through said winding gear train is possible; and

means for releasing said latch means after said flywheel is rotating at high speed whereby said first gear is disengaged from said winding gear train and returned to its normal drive position in said driving gear train for transmitting the energy from said rotating flywheel to said drive shaft.

4,387,605

METHOD AND APPARATUS FOR MOUNTING AN AUTOMOTIVE AUXILIARY TRANSMISSION

James S. Grey, Box 107A, East Otto, N.Y. 14029; R. Daniel Stuart, 230 S. Central Ave., Springville, N.Y. 14141, and Edwin D. Lake, Zoar Valley Rd., Springville, N.Y. 14140

Filed Nov. 21, 1980, Ser. No. 209,017

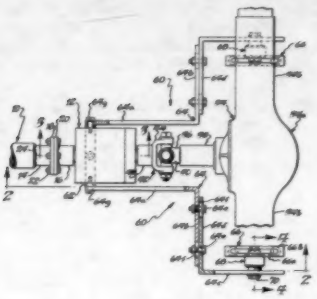
Int. Cl.³ F16M *13/00*; B60K *17/00*; F16H *37/08*

U.S. Cl. 74—694 **11 Claims**

1. In a vehicle power train including a longitudinal main drive shaft; a differential having a pinion shaft, a differential housing at least partially enclosing said pinion shaft and drive axle housings transversely extending from opposite sides of said differential housing; an auxiliary transmission having an input shaft rigidly coupled to said main drive shaft for rotation therewith, an output shaft coupled to said pinion shaft, via a universal joint, a gear train coupling said input and output shafts, and a casing enclosing said gear train and mounting said

input and output shafts for rotational movement with respect thereto; the improvement of an assembly for supporting said casing, comprising:

a bracket assembly including a pair of spaced legs, removably affixed at one of their ends to said casing and extending therefrom for respective removable attachment at their other ends to said drive axle housings; and



means for removably attaching each of said other ends of said spaced legs to its respective one of said drive axle housings, said means including a resilient member having one portion fixedly mounted to its respective drive axle housing and another portion fixedly secured to its respective leg for exerting an upward, lifting force thereagainst to essentially counterbalance the weight of said auxiliary transmission.

4,387,606

AUTOMATIC TRANSMISSION

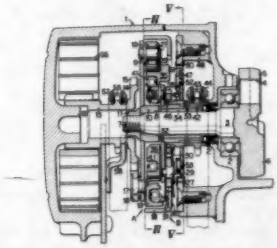
Masumi Hamane, Kawagoe; Akira Shigihara, Asaka, and Masaie Kato, Musashino, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1980, Ser. No. 149,929

Claims priority, application Japan, May 18, 1979, 54-61752; Jul. 6, 1979, 54-86072

Int. Cl.³ F16H *3/74*

U.S. Cl. 74—752 E **6 Claims**



1. An automatic transmission comprising a casing containing a lubricating oil sealed therein, an input member operatively connected to a drive source so as to be rotated thereby, an output member operatively connected to a driven member, a planetary gear mechanism interposed in said casing between said input member and said output member for transmitting power from said input member to said output member, a wet type centrifugally operated clutch means cooperating with said planetary gear mechanism to form a power transmission passage for controlling power transmission between said planetary gear mechanism and said input and output members, and a drive chain transmitting power from said output member to said driven member, said drive chain being sealingly disposed in said casing at a location close to said planetary gear mechanism and having at least a part thereof immersed in the lubricating oil in said casing whereby the lubricating oil is scooped up by said drive chain in accordance with the rotation of said input member so as to be supplied to said planetary gear mechanism.

4,387,607

OVERDRIVE UNIT IN AUTOMATIC TRANSMISSIONS

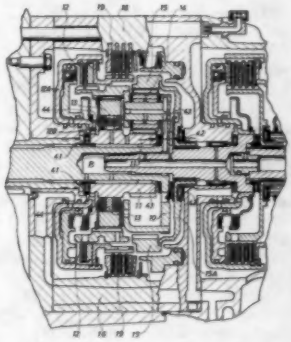
Shiro Sakakibara, Aichi, Japan, assignor to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Filed Aug. 19, 1980, Ser. No. 179,484

Claims priority, application Japan, Aug. 30, 1979, 54-111262

Int. Cl.³ F16H *57/10*

U.S. Cl. 74—781 R **1 Claim**



1. An overdrive apparatus in an automatic transmission comprising:

a planetary gear set including a sun gear, a ring gear and at least one planetary pinon in mesh with the sun gear and the ring gear;

an input shaft concentrically linked with a rotating carrier supporting the planetary pinion;

an output shaft concentrically linked with the ring gear;

a first clutch disengageably coupling the sun gear with the carrier including a first and second clutch hub, said first clutch hub being concentrically linked with the carrier and the second clutch hub being rotatable together with the sun gear;

a brake disposed between the housing of the overdrive apparatus and the second clutch hub;

a one-way clutch between the sun gear and the carrier for overrunning the rotating carrier when the sun gear is braked, said clutch having inner and outer races, one of which being loosely splined with a clutch hub secured to the carrier; and

thrust bearing means interposed between the sun gear and the revolving carrier for supporting any thrust load produced between the sun gear and the revolving carrier wherein a gap is formed between the one-way clutch and the connection portion between the sun gear and the second clutch hub of the brake.

4,387,608

ELECTRONIC CONTROL FOR A STEPLESS VEHICLE TRANSMISSION USING A CONTROL MEMBER RESPONSE TO DYNAMIC PRESSURE

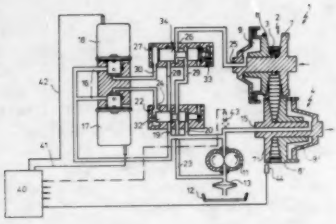
Helmut Mohl, Schwieberdingen; Manfred Schab, Gerlingen; Joseph Sauer, Schwieberdingen, and Alfred Müller, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 5, 1980, Ser. No. 184,388

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936784; Jan. 9, 1980, 3000544

Int. Cl.³ B60K *41/14;* F16H *55/56*

U.S. Cl. 74—866 4 Claims



1. Control apparatus for a continuously variable motor-vehicle transmission of the V-belt type having first and second pulleys of variable effective diameter and a belt for transmitting power between them, each of said pulleys having its effective diameter variable by a disk element thereof displaceable by a pressure medium, a first pressure control valve (27) responsive to a control signal of a system providing regulation in terms of gear ratio, for controlling the pressure for displacing said disk element (2) of said first pulley, a second pressure control valve (22) responsive to a control signal representative of engine load of said motor vehicle for controlling the pressure for displacement of said disk element (4) of said second pulley, means for supplying the output oil supply pressure of an oil pump (11) to said first and second pressure control valves, and further comprising:

electromagnetic pressure controllers (18,17) for generating said control signals for application to said first and second pressure control valves in the form of hydraulic pressures, said electromagnetic pressure controllers being connected to the output of said oil pump (11) and being controlled respectively by an electronic control circuit (40) for setting the gear ratio of said transmission by means of said first pressure control means (27) and by the pressure of said disk element (2,4) against said V-belt and thereby the efficiency of the transmission (1) by means of said second pressure control valve (22), in such a way as to reduce to a minimum the fuel consumption of said engine.

4,387,609

PLASTIC CORK LIFTER

Marvin F. Polsfuss, 676 Silver Ave., San Francisco, Calif. 94134

Filed Dec. 28, 1981, Ser. No. 334,632

Int. Cl.³ B67B *7/02*

U.S. Cl. 81—3.36 4 Claims

1. A prying device comprising an elongated member and a yoke, said elongated member comprising:

a handle section at one end thereof, said handle section being manually-holdable, and

a prying section at the other end,

said prying section having a narrowed prying edge for insertion in a recess in a workpiece and prying against the opposite walls of said recess to widen same,

said prying section also having a slot elongated parallel to the direction of elongation of said member,

said yoke comprising:

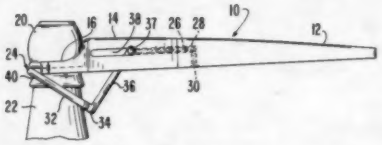
a rigid hoop of a continuous loop of wire extending out from said prying section of said elongated member and back again to said prying section,

said rigid hoop having two free ends positioned in said slot, said free ends of said hoop being pivotable and translatable in said slot such that said wire yoke can pivot in a vertical plane parallel to the direction of elongation of said member,

said hoop having an initial section extending out from the free ends thereof and away from said elongated member in a direction oblique to the direction of elongation of said member and away from said handle section,

said hoop having a rigid bend at the end of said initial section distal from said prying section,

said hoop having a terminal section beyond said bend and oriented such that terminal section and said initial section form a fixed angle when viewed from a direction perpendicular to the direction of elongation of said member,



said terminal section also completing said hoop and having two first portions extending in opposite directions from said bend and perpendicular to said initial portion of said hoop,

said terminal section of said hoop also having a remainder portion joining said two first portions to complete said hoop,

said terminal section being capable of extending from said bend toward said elongated member at an oblique angle and away from said handle section, such that said bend can be braced against said workpiece to serve as a fulcrum when said hoop is placed around said workpiece and said prying section is inserted into said recess in said workpiece,

whereby when said prying edge is inserted in said recess in said workpiece and said yoke is looped around said workpiece with said bend of said hoop against said workpiece, said bend will serve as said fulcrum against said workpiece and said handle can be rotated in said vertical plane about said fulcrum and toward said workpiece to cause said prying edge to widen said recess.

4,387,610

CHORDAL MECHANISM

Ronald G. Sergeant, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 314,266, Oct. 23, 1982, abandoned, which is a continuation of Ser. No. 137,035, Apr. 3, 1980, abandoned. This application Jul. 26, 1982, Ser. No. 401,674

Int. Cl.³ B25B *7/00*

U.S. Cl. 81—5.1 R 7 Claims

1. A force applying mechanism moulded in one piece of plastics material and comprising:

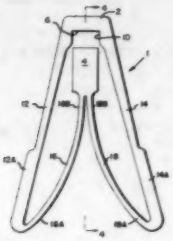
first and second jaw portions,

a pair of elongate, first chords joined to said first jaw portion and diverging outwardly therefrom, and

a pair of elongate, second chords having first end portions joined to respective first chords and second end portions joined to said second jaw portion,

the second chords having flexible, convex portions which are brought progressively into supporting engagement with each other and flattened on pivotal movement of the

first chords towards each other to close the jaw portions relatively together during application of a force, and



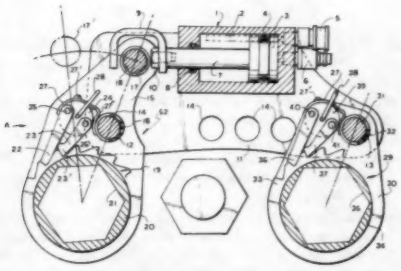
said first jaw portion providing a track guiding said second jaw portion during closure of the jaw portions relatively together.

4,387,611

HYDRAULIC WRENCH FOR SIMULTANEOUSLY TIGHTENING OR LOOSENING AT LEAST TWO THREADED CONNECTORS

John K. Junkers, 7 Arrowhead La., Saddle River, N.J. 07458

Filed May 19, 1981, Ser. No. 265,234
Int. Cl.³ B25B *13/00*
U.S. Cl. 81—57.36 **17 Claims**



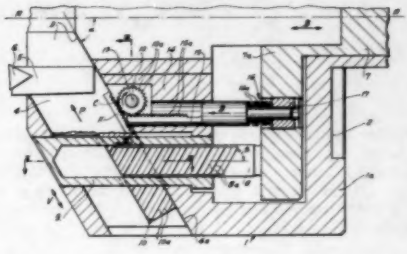
1. A hydraulic wrench comprising fluid-operated cylinder-and-piston means including a cylinder, a piston reciprocatable in said cylinder between a forward stroke and a return stroke and a piston rod fixed at one end to said piston and projecting at its other end beyond said cylinder; connecting means connected to said cylinder projecting to one side thereof; ratchet lever means pivotally mounted between its ends on said connecting means for tilting movement about a first pivot axis, pivotally connected at one end to said other end of said piston rod and provided in the region of its other end with means for engaging a polygonal member of a first threaded connector to be turned during the active stroke of said piston; ratchet link means pivotally attached at one end to said connecting means for tilting movement about a second pivot axis parallel to said first pivot axis and transversely spaced therefrom, said ratchet link means being provided in the region of the other end thereof with means for engaging the polygonal member of a second threaded connector, whereby during said active stroke of said piston said cylinder and said connecting means will be shifted substantially in the direction of said active stroke to tilt said ratchet link means in the same direction as said ratchet lever means so that the members of two threaded connectors respectively engaged in the engaging means of said ratchet lever means and said ratchet link means will be simultaneously turned.

4,387,612

TURNING HEAD, IN PARTICULAR A FACING HEAD

Otto Eckle, and Paul Winger, both of Loechgau, Fed. Rep. of Germany, assignors to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany

Filed Nov. 28, 1980, Ser. No. 210,904
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1979, 7936754[U]
Int. Cl.³ B23B *3/26, 29/34*
U.S. Cl. 82—2 E **6 Claims**



1. In an apparatus for supporting a tool on a rotatable spindle of a machine tool, including a frame adapted to be secured to the spindle, a slider supported on the frame for movement radially of the axis of rotation of the spindle, having means for supporting the tool thereon and having a toothed first rack thereon extending in the direction of movement thereof, an adjusting member movably supported on said frame and having teeth thereon which operatively engage the teeth of said first rack, movement of said adjusting member effecting radial movement of said slider and said slider being urged radially outwardly by centrifugal forces generated by rotation of the spindle, and counteracting means for exerting a radially inwardly directed force on said slider to counteract centrifugal forces acting thereon, the improvement comprising wherein said counteracting means includes a toothed second rack on said slider extending in the direction of movement thereof, pinion means rotatably supported on said frame and having teeth operatively engaging the teeth of said second rack, an axially extending third rack having teeth operatively engaging teeth of said pinion means and means supporting said third rack for axial movement relative to said frame, and resilient means cooperable with said third rack and one of said frame and adjusting member for yieldably urging axial and rotational movement of said third rack and pinion means, respectively, in directions which correspond to radially inward movement of said slider.

4,387,613

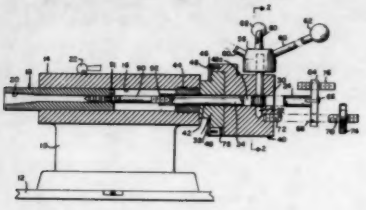
ENGINE LATHE TAIL STOCK RAM DRIVE

Kenneth C. Blaisdell, 71 Pond St., Georgetown, Mass. 01833

Filed Feb. 2, 1981, Ser. No. 230,439
Int. Cl.³ B23B *23/00*
U.S. Cl. 82—31 **3 Claims**

1. In an engine lathe tail stock having a guide, said guide having attaching means disposed at the rear end, a ram longitudinally movable in the guide, the guide and the ram permitting relative movement therebetween about the axis of the guide, the combination with said tail stock guide and ram of an attachment comprising: an adapter having attaching means cooperable with those of the guide for removably mounting the adapter in a position about the axis of the guide, said adapter having a bore axially aligned with said guide, a housing, means for removably mounting said housing to said adapter in a position about the axis of said adapter, said housing having a bore axially aligned with said guide and said adapter, said housing comprising: a rack mounted for sliding movement

with respect to said adapter and guide for imparting movement to said ram, a pinion in mesh with said rack, means for imparting movement to said pinion, and adjustable means for selectively limiting the movement of said rack, said adjustable means carried by said rack for selectively limiting the move-



ment of said rack comprising a bracket mounted on said rack, an adjustable stop means carried by said bracket for selectively limiting the forward movement of said rack, and other stop means attached to said housing and in slidable engagement with said bracket for limiting the rearward movement of said rack.

4,387,614

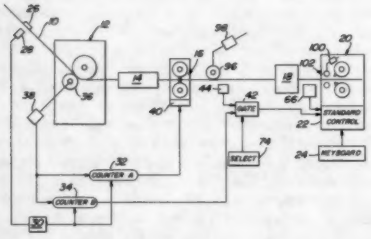
AUTOMATED WEB CHOP-OUT CONTROL FOR CUT-TO-MARK CUT-OFF MACHINE

Donald J. Evans, Cherry Hill, N.J., assignor to Molins Machine Company, Cherry Hill, N.J.

Continuation-in-part of Ser. No. 265,509, May 20, 1981. This application May 21, 1981, Ser. No. 265,890

Int. Cl.³ G05B *19/28;* B26D *5/20*

U.S. Cl. 83—38 **11 Claims**



1. A method of automatically controlling a cut-off machine having knives operable in a cut-to-mark mode wherein the knives cut a moving web divisible into a leader having a first set of registration marks and a trailer having a second set of registration marks, there being a transition between the first and second sets of marks, comprising:

(a) applying a target to the trailer adjacent a first preselected registration mark of the second set;

(b) tracking the target electronically to a shear upstream of the cut-off machine;

(c) automatically and repetitively severing the web transversely at the shear two or more times when the target is tracked to the shear whereby a preselected portion of the web comprising the transition between said registration marks is chopped out of the web;

(d) tracking the leading edge of the trailer electronically from said shear to a position intermediate the shear and said cut-off machine after said preselected web portion has been chopped from the web;

(e) causing the knives to cut the trailer automatically at a second preselected registration mark of the second set following the leading edge of the trailer; and

(f) causing the knives to cut the trailer automatically in the cut-to-mark mode at the registration marks of the second set which follow said second preselected registration mark.

4,387,615

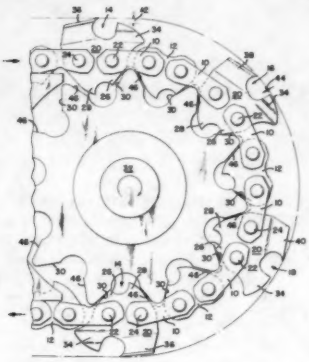
ANTI-KICK SAW CHAIN AND A KICK-REDUCING METHOD

Douglas J. Lemery, Victoria, Canada, assignor to Kolve Sawchain Company, Portland, Oreg.

Filed Nov. 16, 1981, Ser. No. 321,403

Int. Cl.³ B27B *33/14*

U.S. Cl. 83—56 **13 Claims**



1. A method for reducing the possibility of a kick by the saw chain of a chain saw when cutting on the end of the chain saw's bar, wherein the saw chain includes a plurality of cutter elements forming an endlesses belt and wherein the elements each include a leading depth gauge and a trailing tooth, comprising the steps of:

(a) pulling the saw chain to engage a cutter element with a tooth of an idler sprocket on the end of the bar of the chain saw; and

(b) cocking the cutter element as the cutter element begins to move in an arc around the end of the bar to ensure that the distance between the leading depth gauge and trailing tooth is no greater than the distance between the leading depth gauge and trailing tooth when the saw chain is moving in a straight line.

4,387,616

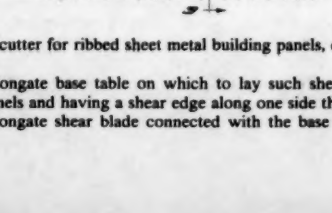
SHEET METAL SHEAR

Ralph Ireland, Mankato, Minn., assignor to Dayton Rogers Manufacturing Co., Minneapolis, Minn.

Filed Jan. 5, 1981, Ser. No. 222,595

Int. Cl.³ B23D *17/08, 23/00*

U.S. Cl. 83—608 **15 Claims**



1. A cutter for ribbed sheet metal building panels, comprising

an elongate base table on which to lay such sheet metal panels and having a shear edge along one side thereof,

an elongate shear blade connected with the base table to

move downwardly along the shear edge and cut the sheet metal panel, and

a multiplicity of cutting anvils on the base table and spaced from each other along the shear edge thereof, the anvils having front faces lying flush with the shear edge of the base table, the peripheral edges of the front faces conforming to the shape of the ribs of the sheet metal panels, the anvils also having fore and aft side faces adjoining the front faces in sharp-cornered relation whereby the peripheral edges define cutting edges for cooperating with the blade in cutting the ribbed portions of the panels, and releasable securing means anchoring the anvils on the base table.

4,387,617

ASSIGNER FOR ELECTRONIC MUSICAL INSTRUMENT

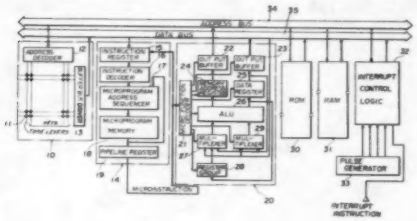
Hirokazu Kato, and Akinori Endo, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Continuation-in-part of Ser. No. 865,357, Dec. 28, 1977, abandoned. This application Feb. 25, 1980, Ser. No. 124,006

Claims priority, application Japan, Dec. 29, 1976, 51-158950; Dec. 29, 1976, 51-158951

Int. Cl.³ G10H *1/18, 1/24, 7/00*

U.S. Cl. 84—1.01 **21 Claims**



1. An assigner for an electronic musical instrument having keyboard's keys and tone levers, which comprises: a microprogram section storing a microprogram; memory means storing frequency information corresponding to the respective keys and tone data corresponding to the respective tone levers and having storing positions which define tone producing channels, and an arithmetic section which is controlled by said microprogram in such a manner that the frequency information and the tone data requested for a keyboard's key being operated and the tone lever being operated are assigned to the tone producing channels specified by said arithmetic section.

4,387,618

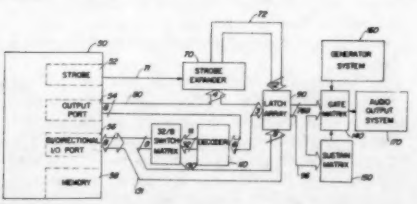
HARMONY GENERATOR FOR ELECTRONIC ORGAN

Carlton J. Simmons, Jr., Florence, Ky., assignor to Baldwin Piano & Organ Co., Cincinnati, Ohio

Filed Jun. 11, 1980, Ser. No. 158,585

Int. Cl.³ G10F *1/00;* **G10H** *3/06*

U.S. Cl. 84—1.03 **22 Claims**



1. A harmony generator for an electronic organ having at least one keyboard, a generator system, and an audio system, comprising:

storage means for storing data identifying all notes to be sounded by the organ;

input means for loading the storage means with played key data identifying the played keys of a keyboard;

fill-in means, responsive to at least one played key for identifying the nomenclatures of the fill-in notes and responsive to at least a second played key for identifying the octave in which the fill in notes are to be sounded, for generating fill-in data identifying notes to be filled in, and loading the fill-in data into the storage means; and

output means for controlling the transmission of signals from the generator system to the audio system in accordance with the played key data and the fill-in data in the storage means.

16. A harmony generator for an electronic organ having a solo keyboard, an accompaniment keyboard, a generator system, and an output system, comprising:

storage means for storing data identifying the notes to be sounded by the organ;

input means for scanning the keyboards and loading the storage means with data identifying the played keys of the keyboards;

fill-in means responsive to the highest solo note played for generating fill-in data identifying at least one fill-in note which corresponds to the nomenclature of at least one played key of the accompaniment keyboard, and which is located in the octave above the highest played note of the solo keyboard, and for loading the fill-in data into the storage means; and

output means for controlling the transmission of signals from the generator system to the audio system in accordance with the played key data and the fill-in data in the storage means.

4,387,619

SYSTEM FOR GENERATING SAMPLE TONES ON AN ELECTRONIC MUSICAL INSTRUMENT

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

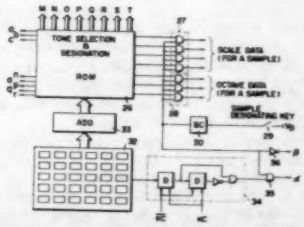
Continuation of Ser. No. 114,571, Jan. 23, 1980, which is a continuation of Ser. No. 950,512, Oct. 11, 1978. This application Aug. 13, 1981, Ser. No. 292,697

Claims priority, application Japan, Oct. 15, 1977, 52-123695

The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **5 Claims**



1. A sample tone-generating system for an electronic musical instrument for generating one sample tone corresponding to a selected musical tone color out of a plurality of different types of musical tone colors comprising:

specifying means for selectively specifying a given one of said different types of musical tone colors,

means for setting respective different types of said musical tone colors in response to said specifying means;

performance keys for playing a musical performance in accordance with the specified type of musical tone color,

tone producing means coupled to said setting means for producing said specified type of musical tone color which corresponds to the tone color specified by said specifying means by operation of said performance keys, and

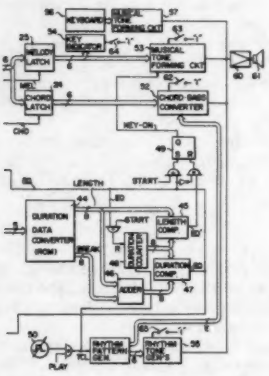
sample tone generating means coupled to said specifying means and responsive only to the operation of said specifying means for generating a sample tone having a prescribed pitch, said sample tone corresponding to the specified tone color which corresponds to said given one of the different types of musical tone colors.

4,387,620

AUTOMATIC PERFORMING APPARATUS FOR MUSICAL PERFORMANCE DATA WITH MAIN ROUTINE DATA AND SUBROUTINE DATA

Eisaku Okamoto, and Kotaro Mizuno, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Nov. 13, 1981, Ser. No. 320,933
Claims priority, application Japan, Nov. 19, 1980, 55-162024
Int. Cl.³ G10H 1/42, 3/06, 7/00
U.S. Cl. 84—1.03 5 Claims



1. An automatic performing apparatus comprising:

a first memory or storing note pitch data representing pitches of musical notes constituting progression of a music to be played;

musical tone forming circuit means coupled to said first memory or forming musical tone signals in response to note pitch data read out of said first memory;

a second memory for storing note duration data representing the durations of the musical notes, the note duration data having duration main routine data and duration subroutine data, the duration main routine data containing instruction data for calling the duration subroutine data, and the duration subroutine data containing instruction data for the return to the duration main routine data;

duration measuring circuit means coupled to said second memory for measuring a time length represented by note duration data read out of said second memory;

first readout control circuit means for sequentially reading the note pitch data of musical notes out of said first memory at time intervals corresponding to the durations of the musical notes in response to said duration measuring circuit means;

second readout control circuit means for sequentially reading the note duration data of musical notes out of said second memory at time intervals corresponding to the durations of the musical notes in response to said duration measuring circuit means; and

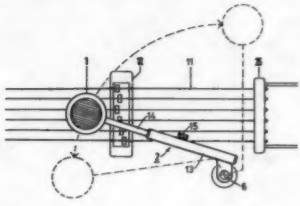
subroutine control circuit means coupled to said second memory and responsive to the instruction data for calling the duration subroutine data read out during the readout of the main routine data from said second memory to cause said second readout control circuit means to read the duration subroutine data out of said second memory, and responsive to the instruction data for the return to the duration main routine data read out from said second memory to cause said second readout control circuit means to read said duration main routine data out of said second memory.

4,387,621

MANUAL CONTROL LEVER FOR STRINGED INSTRUMENTS

Ranier Franzmann, Rehhagweg 9, 7800 Freiburg, Fed. Rep. of Germany

Filed Sep. 3, 1980, Ser. No. 183,695
Int. Cl.³ G10H 3/00
U.S. Cl. 84—1.16 15 Claims



1. A stringed musical instrument having a body, strings extending over a portion of said body and arranged to be engaged by fingers on a hand of a person to vibrate the strings to produce sound, a control lever mounted on said instrument body,

(a) said control lever having a hand rest portion on which a player's hand may rest while the fingers of such hand engage said strings,

(b) said lever being swingably mounted on said instrument body for swinging movement of said hand rest portion both in a direction across said strings at an elevation above them and in a direction upwardly farther above and downwardly closer to said strings,

(c) the upward and downward swinging movement of said lever being through a first range from an uppermost unoperated position to an intermediate normal position and a second range from said normal position farther downwardly to a lowermost maximum position,

(d) means tending to raise said lever to said unoperated position and resisting downward motion from such position,

(e) motion-resisting stop means determining said normal position and providing additional resistance to downward motion when said lever reaches said normal position, so that greater downward pressure on said hand rest portion is required to move said lever downwardly through its second range than the pressure required to move it downwardly through its first range, and

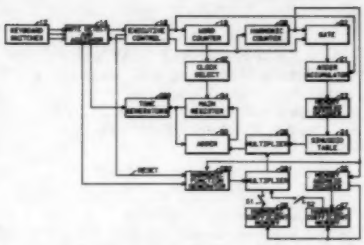
(f) electronic sound converter means responsive to said upward and downward swinging movement of said lever for controlling an element of the sound heard as a result of playing said strings.

4,387,622

MUSICAL TONE GENERATOR WITH INDEPENDENT TIME VARYING HARMONICS

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jul. 20, 1981, Ser. No. 284,744
Int. Cl.³ G10H *1/06*
U.S. Cl. 84—1.22 **11 Claims**



1. In a keyboard musical instrument having a number of tone generators, in which a plurality of data words corresponding to the amplitudes of a corresponding number of evenly spaced points defining the waveform of a musical tone are computed during a sequence of computation cycles and are transferred sequentially to a digital-to-analog converter at a rate proportional to the pitch of the tone being generated, apparatus for generating tones having independent time-varying harmonic components comprising:

a coefficient memory for storing a set of harmonic coefficient values,

a first addressing means for reading out harmonic coefficient values from said coefficient memory,

a formant clock for providing a sequence of format timing signals

a curve memory for storing a plurality of sets of curve parameter values wherein each set of said sets of curve parameter values corresponds to one of said harmonic coefficient values,

a first addressing means wherein a harmonic address signal is generated and whereby a harmonic coefficient value corresponding to said address signal is read out from said coefficient memory,

a parameter addressing means responsive to said harmonic address signal whereby a plurality of curve parameter values is read out sequentially from said curve memory in response to said sequence of formant timing signals wherein said read out plurality of curve parameter values are from a set of curve parameter values corresponding to said harmonic address signal,

a harmonic scale factor generation means whereby a sequence of harmonic scale factors are computed recursively in response to said parameter values read out sequentially from said curve memory to produce a sequence of time variant harmonic scale factor values corresponding to said harmonic address signal,

a first multiplier means wherein said read out harmonic coefficient value is multiplied by said sequence of time variant harmonic scale factor values thereby producing a sequence of time variant harmonic coefficient values corresponding to each harmonic coefficient value read out from said coefficient memory,

a means for computing, responsive to said sequence of time variant harmonic coefficient values corresponding to each harmonic coefficient value read out from said coefficient memory, whereby a master data set defining said waveform of a musical tone is generated during each one of said sequence of computation cycles, and

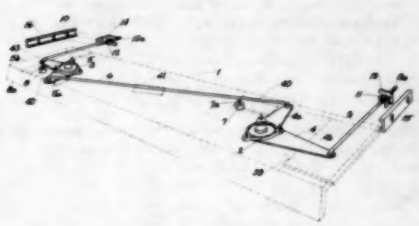
a means for producing musical tones from said master data set having said independent time-varying harmonic components.

4,387,623

PARALLEL MOTION LINKAGE FOR THE SLIDING KEYBOARD COVER OF A PIANO

Thomas E. Kimble, Covington, Ky., assignor to Baldwin Piano & Organ Company, Cincinnati, Ohio

Filed Sep. 11, 1981, Ser. No. 301,384
Int. Cl.³ G10C *3/02*
U.S. Cl. 84—179 **8 Claims**



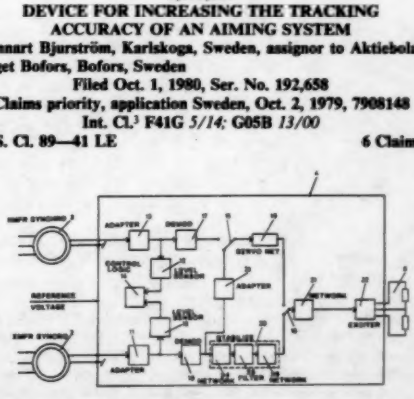
1. In a piano of the type having a piano case, a keyboard and an elongated sliding keyboard cover extending transversely of said piano case and being shiftable between an open (key exposing position) and a closed (key covering) position, the improvement comprising a parallel motion linkage assembly to assure that said sliding keyboard cover shifts in a direction perpendicular to its long axis to prevent skewing or jamming of said cover in said case, said parallel motion linkage comprising a pair of identical, oppositely oriented bell cranks rotatively affixed to the underside of said sliding keyboard cover near the ends thereof, said bell cranks each having a short arm and a long arm oriented at about 90° to each other, a tie rod, said short arms of said bell cranks being connected together by said tie rod pivotally affixed to the ends thereof, a pair of connecting rods having first and second ends, said first end of each of said connecting rods being pivotally affixed to the end of said long arm of one of said bell cranks, and means to adjustably secure each of said connecting rods near said second end thereof to said piano case.

4,387,624

DEVICE FOR INCREASING THE TRACKING ACCURACY OF AN AIMING SYSTEM

Lennart Bjurström, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Oct. 1, 1980, Ser. No. 192,658
Claims priority, application Sweden, Oct. 2, 1979, 7908148
Int. Cl.³ F41G *5/14*; G05B *13/00*
U.S. Cl. 89—41 LE **6 Claims**



1. A device for increasing the tracking accuracy of a gun aiming servo system for a moving target comprising:

a stabilizing and accuracy increasing network for processing a signal in said servo system, said network including an integrating second order filter having a transfer function of

$$\frac{1 + 2\rho_1 \frac{s}{\omega_1} + \frac{s^2}{\omega_1^2}}{1 + 2\rho_2 \frac{s}{\omega_2} + \frac{s^2}{\omega_2^2}}$$

where ρ_1 and ρ_2 are damping factors, and ω_1 and ω_2 are angular frequencies of the gun base movements and target and said transfer function has a maximum amplitude for signals which have a frequency of substantially ω_1 and ω_2.

4,387,625

BRAKE BOOSTER

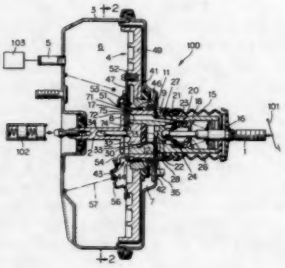
Masayoshi Katagiri, Toyota, and Osamu Ogura, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed Jan. 8, 1981, Ser. No. 223,565

Claims priority, application Japan, Feb. 9, 1980, 55-15002

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—369 B **10 Claims**



1. A brake booster comprising:

a casing;

a power piston disposed in said casing to divide an area within said casing into two chambers for being moved in accordance with the difference of pressure in the two chambers;

a control piston, having therein a control valve for controlling the difference of pressure in said two chambers and a transmission mechanism for transmitting an input force of an input member, being coaxially fitted into a central bore of said power piston relatively movable thereto;

at least one ball accommodating recess formed on the external peripheral surface of said control piston, whose bottom surface includes a portion progressively deepened along the forward direction;

at least one ball movably accommodated in said ball accommodating recess so as to partly protrude from the external peripheral surface of said control piston;

at least one ball driving surface formed on the internal peripheral surface of said power piston for advancing said ball together with said power piston when the same is advanced;

said ball driving surface including an acute slope portion and a gentle slope portion, said gentle slope portion being located at the rear side of said acute slope portion and being formed to contact with said ball which has been accommodated in a deep portion of said ball accommodating recess when said power piston has relatively been advanced to said control piston as far as the forwardmost position;

a ball retainer movably retaining said ball in the radial direction; and

at least one reaction lever abutted at an output portion in the middle thereof by an output member and at a first input portion on a first side thereof and a second input portion on a second side thereof by said ball retainer and said transmission mechanism respectively.

4,387,626

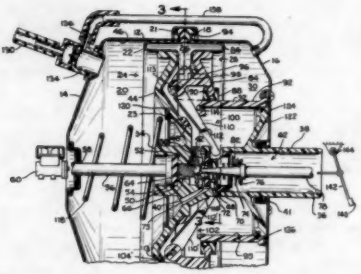
TANDEM BRAKE BOOSTER

Lawrence R. Myers, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 9, 1981, Ser. No. 242,087

Int. Cl.³ F15B *9/10*; F01B *19/00, 7/04*

U.S. Cl. 91—376 R **14 Claims**



1. In a tandem brake booster having a housing with a cavity therein divided into a first chamber and a second chamber by a wall arrangement and a valve mechanism responsive to an input signal for interrupting communication of a first fluid between said first and second chambers and thereafter allowing a second fluid to be communicated to said second chamber and permit a pressure differential to develop across said wall arrangement, said pressure differential acting on said wall arrangement to create an output force corresponding to said input signal, said wall arrangement being characterized by a first member connected to a second member by lever means, said first and second members responding to said pressure differential by moving in opposite directions to develop first and second forces, respectively, said lever means engaging a fulcrum to transfer said second force to said first member and combined therein with said first force to produce said output force.

4,387,627

PISTON RING GROOVE REINFORCEMENT

Jean-Claude Avezou, Poitiers, France, assignor to Associated Engineering France, S.A., France

Filed Jul. 18, 1980, Ser. No. 170,176

Claims priority, application United Kingdom, Jul. 19, 1979, 7925234

Int. Cl.³ F16J *1/04*

U.S. Cl. 92—222 **6 Claims**

1. A piston comprising

a piston body of a material selected from the group of aluminium and aluminium alloys,

a plurality of piston ring grooves formed in the piston body and having substantially uniform depth around the piston,

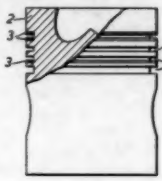
two side surfaces included in each piston ring groove,

an annular reinforcing ring received within one of said piston ring grooves and having a substantially uniform radial width equal to the radial depth of the piston ring groove,

a first surface included on the reinforcing ring and forming one side surface only of the piston ring groove,

a second surface included on the reinforcing ring and forming an interface with one piston ring groove side surface, and

means on the piston ring groove surface and means on the



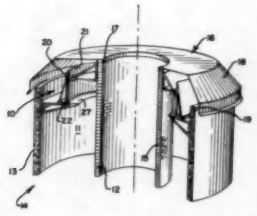
reinforcing ring surface defining a mechanical interlock therebetween at said interface including material of said piston penetrating recesses in said ring whereby the reinforcing ring is retained in the piston ring groove by a mechanical bond.

4,387,628

CHIMNEY SEAL

Dennis H. Sapp, Terre Haute, Ind., assignor to Research-Cottrell, Inc., Somerville, N.J.

Filed Oct. 10, 1980, Ser. No. 196,112
Int. Cl.³ F23J *11/00*
U.S. Cl. 98—58 **15 Claims**



1. In a chimney structure having a radially inner tubular liner and a radially outer tubular wall defining a tubular space therebetween wherein a pressurized fluid is provided to prevent flow of gaseous products of combustion from within said liner into said space, improved means for sealing an upper end portion of the liner to an upper end portion of the outer wall to retain the pressurized fluid in said space, said improved sealing means comprising:

a first, annular seal;

means for sealingly mounting said seal to one of said liner or outer wall at the upper end portion thereof;

a movable seal support defining a cylindrical sealing surface; and

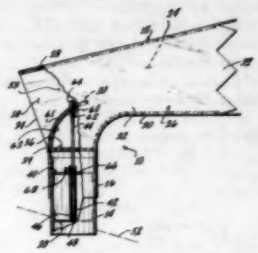
means for sealing said seal support to the other of said liner or outer wall including cooperating radially sliding seal means including a second, annular seal, permitting sealed radial movement of said second seal toward and from said other of the liner or outer wall to which it is mounted, said seal support sealing surface having longitudinally slidable sealed engagement with said first seal permitting longitudinal movement between said liner and outer wall while maintaining sealed engagement of said second seal with said first seal.

4,387,629

DEVICE FOR EXTRACTING AIR FROM THE INTERIOR OF A STRUCTURE

Ross A. Bolton, 72 Cook St., North Ward, Townsville-4810, Queensland, Australia

Filed Oct. 26, 1981, Ser. No. 315,176
Claims priority, application Australia, Jan. 8, 1981, 66087/81
Int. Cl.³ F23L *17/02*
U.S. Cl. 98—78 **12 Claims**



1. A device for extracting air from the interior of a structure which comprises:

a housing having a hollow interior and including a front opening and a rear opening, each of which opens into said interior of said housing, said front and said rear openings allowing for air flow into said front opening through said interior of said housing and exiting out of said rear opening, said housing including a shell at least a portion of which is formed as an elongated chamber, said front opening and said rear opening of said housing located at respective front and rear ends of said chamber;

baffle means positioned within the interior of said housing, said baffle means forming a constricted cross sectional area within the interior of said housing and capable of creating an area of reduced air pressure within the interior of said housing in response to air moving through said interior of said housing;

port means formed in said housing and located in association with said baffle means and said area of reduced air pressure and including said port means comprising a bottom opening located on the bottom surface of said chamber adjacent to said front opening;

connecting means associated with said port means and rotatably connecting said housing to said structure such that said housing can freely rotate on said structure about an axis of rotation, said connecting means in association with said port means further connecting said area of reduced air pressure within the interior of said structure to allow said air to move from the interior of said structure into said housing in response to a pressure differential between the interior of said structure and the area of reduced air pressure;

orientation means associated with said housing and capable under the influence of moving air of causing said housing to rotate about said axis of rotation to orient said front opening of said housing in a direction pointing into said moving air, said orientation means comprising said housing being elongated in shape and said connecting means and said port means both being located proximal to said front opening and said portion of said housing located between said rear opening and said axis of rotation being of a substantially greater elongated dimension than said portion of said housing located between said front opening and said axis of rotation such that said axis of rotation of said housing is positioned proximal to said front opening and the portion of said housing located between said axis of rotation and said rear opening is capable of being contacted by said moving air whenever said front opening is

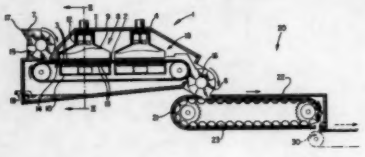
not oriented in a direction pointing into said moving air and when said portion of said housing located between said axis of rotation and said rear opening is contacted by said moving air, the force of said moving air against said portion rotates said housing about said axis of rotation until said front opening is oriented in a direction pointing into said moving air.

4,387,630

FOOD PROCESSING WITH STEAM

Gordon E. Timbers, Nepean; Robert Stark, Centreville; Jacques C. Caron, Orleans; Daniel B. Cumming, Summerland; Richard R. Cowmeadow, Halifax, and Alexander W. Gingell, Bridgewater, all of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Jun. 8, 1982, Ser. No. 386,309
Claims priority, application Canada, Aug. 20, 1981, 384276
Int. Cl.³ A23L *3/04*
U.S. Cl. 99—348 **10 Claims**



1. An apparatus for processing food products with steam comprising a heating module and a holding module;

said heating module comprising a pervious conveyor, a plurality of upwardly directed steam emitting nozzles positioned below the conveyor for agitating and heating food products on the conveyor, an outer enclosure enclosing the conveyor and nozzles, a feed valve defining the inlet to the enclosure and for depositing a multilayer of food products on the conveyor, and a transfer valve for transferring heated food products from the heating module to the holding module;

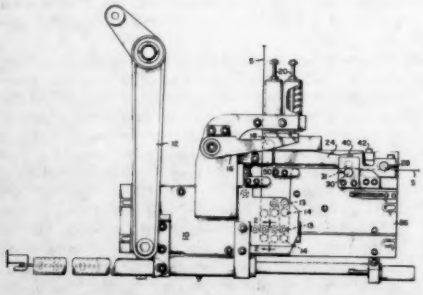
said holding module comprising a holding conveyor having receptacle means for receiving heated food products from the heating module, and holding the heated food products for a period of time at an elevated temperature.

4,387,631

STRAP TENSIONING APPARATUS

James A. Pasic, Montesano, Wash., assignor to Ovalstrapping, Inc., Hoquiam, Wash.

Filed May 11, 1981, Ser. No. 262,301
Int. Cl.³ B65B *13/22*
U.S. Cl. 100—32 **4 Claims**



1. In a machine for applying from a strap supply a flexible strap or other binding material having a supply end and an object end through a feed path to form a loop around an object, a strap tensioning mechanism for pulling the strap around the object to remove slack and then tightening the loop around the object as the object end of the strap is held, comprising:

strap gripping means for releasibly gripping the supply end of the strap against longitudinal movement at a holding location as the strap is pulled around the object at a first tension,

means for varying the gripping pressure on the strap by said gripping means at said holding location for allowing longitudinal movement of the strap toward the object relative to the gripping means at a desired final tension greater than said first tension, and

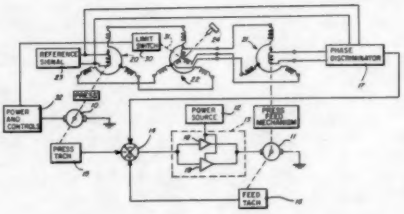
means for laterally deflecting the strap out of said feed path while the object and supply ends of the strap are held for pulling the strap and tightening the loop around the object at said first tension and then at said greater final tension while the supply end of the strap remains free to move longitudinally from the supply at said final tension.

4,387,632

CONTROL SYSTEM FOR SYNCHRONIZING POWER PRESSES AND ASSOCIATED FEED MECHANISM WITH INTERLOCK FEATURES

Francis E. Heiberger, Elmhurst, Ill., assignor to Danly Machine Corporation, Chicago, Ill.

Filed Jul. 20, 1981, Ser. No. 284,940
Int. Cl.³ B30B *15/30*
U.S. Cl. 100—45 **7 Claims**



1. A control system for a press having a synchronized feed mechanism, said control system comprising

a first drive motor for the press and a second drive motor for the feed mechanism,

means responsive to the positions of the press and the feed mechanism for producing an output signal representing any change in the positional relationship between the press and the feed mechanism,

control means responsive to said output signal for controlling the speed of the drive motor for the feed mechanism,

means for adjusting said position responsive means to simulate a change in the press position and thereby effect a movement of the feed mechanism, and

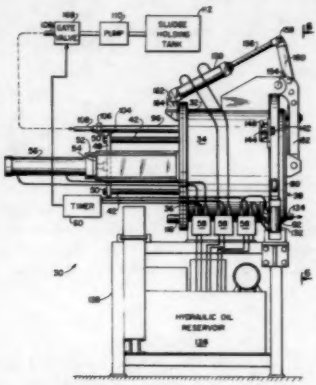
interlock means responsive to adjustments of said position responsive means for enabling the startup of the press when said position responsive means is in a preselected position representing a desired positional relationship between the press and the feed mechanism, and for disabling the startup of the press when said position responsive means is in any position representing an undesired positional relationship between the press and the feed mechanism, so that the press can be started only when the feed mechanism is in the desired position relative to the startup position of the press.

4,387,633

SLUDGE PROCESSING SYSTEM

James Ballantyne, 25 Cornish Dr., Westfield, Mass. 01085

Filed Feb. 6, 1981, Ser. No. 232,404
Int. Cl.³ B30B 9/06
U.S. Cl. 100—48 15 Claims



13. A system for the compaction of sludge material held within a chamber, said system comprising:

piston means in said chamber for exerting a succession of compaction strokes on a block of said sludge material supported within said chamber;

means within said chamber which permit the egress of fluid from the sludge upon compression thereof by said piston;

conduit means opening into said chamber for injecting further sludge into said chamber between said compaction strokes for enlargement of said block from stroke to stroke;

means including a door operatively connected to said chamber for extraction of said block upon the occurrence of the last of said succession of strokes to permit expulsion of said block from said chamber by said last stroke;

a door operatively connected to said chamber which opens for extraction of said block, said door having outwardly extending projections about the outer periphery with spaces therebetween; and

a ring rotatably connected to said chamber and positioned about the outer periphery of said door having inwardly extending projections with spaces therebetween, wherein rotation of said ring in one direction brings said projections into registration with one another for securing said door to said chamber when said piston is compressing the sludge into a block, and wherein rotation of said ring in the other direction brings said projections into registration with said spaces for unlocking and opening said door to permit expulsion of said block.

4,387,634

DIAPHRAGM PRESS FOR AGRICULTURAL PRODUCTS, SUCH AS GRAPES, FRUITS AND OTHER FRUIT-LIKE PRODUCTS

Valentin Balass, Zürich, Switzerland, assignor to Bucher-Buyer AG, Niederweningen, Switzerland

Filed Nov. 16, 1981, Ser. No. 321,678
Claims priority, application Switzerland, Nov. 25, 1980, 8691/80
Int. Cl.³ B30B 5/02
U.S. Cl. 100—211 7 Claims

1. A diaphragm press for agricultural products, especially grapes, fruits and fruit-like products, comprising:

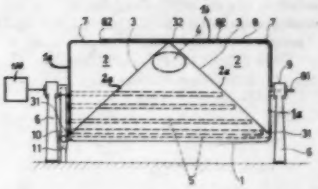
a press container having opposed end walls and intermediate thereof a container jacket and a substantially horizontal lengthwise axis;

means mounting said press container for rotation about said lengthwise axis;

means for driving said container to be rotatable about said lengthwise axis;

two diaphragms provided internally of said press container;

each of said diaphragms, in an unloaded state thereof, bearing against a portion of a related one of the end walls of the container and against a region of the container jacket neighboring the related one of said end walls;



said container being provided with means defining a product throughpass opening;

attachment means provided for each of said two diaphragms for mounting same within said press container;

said attachment means for each diaphragm extending essentially in a plane positioned at an inclination with respect to the lengthwise axis of the press container;

each of said diaphragms having attachment surfaces; and

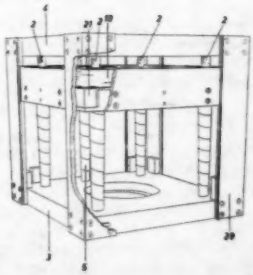
said attachment surfaces of said two diaphragms extending in opposite inclination towards said product throughpass opening.

4,387,635

MACHINE TOOL

Kaj Abbestam, Bollebygd, and Göran Palmers, Askim, both of Sweden, assignors to Institutet for Verkstadsteknisk Forskning, Gothenburg, Sweden

Filed May 5, 1981, Ser. No. 260,729
Claims priority, application Sweden, May 6, 1980, 8003365
Int. Cl.³ B30B 1/18, 15/04
U.S. Cl. 100—214 5 Claims



1. In a machine tool for pressing and cutting operations having a bottom plate and a top plate arranged in spaced relationship, a plurality of upright externally screw threaded spindles non-rotatably mounted at their ends in said bottom and top plate, and a yoke member for supporting tools to perform said operations moveably mounted on said spindles for reciprocating movement between said bottom and top plates, the improvement comprising non self-braking drive nuts rotatably mounted in said yoke member and operably coaxially engaging said screw-threaded spindles so that rotation of said nuts moves said nuts and said yoke along said

spindles, drive means mounted on said machine tool operably connected to said nuts to simultaneously and synchronously rotate said nuts, elongated reinforcing guide members extending substantially along and adjacent to said spindles and attached at their ends to said bottom and top plates, and slide bearings mounted on said yoke and slidably engaging said guide members to guide and laterally support said yoke during its reciprocating movement.

4,387,636

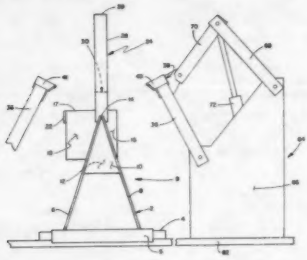
APPARATUS FOR CRUSHING AND REMOVING RIMS FROM WHEELS

Dean A. Depew, and Harold K. Murphy, both of Fort Wayne, Ind., assignors to Harold K. Murphy, Fort Wayne, Ind.

Filed May 22, 1981, Ser. No. 266,793

Int. Cl.³ B30B *7/04*

U.S. Cl. 100—232 **11 Claims**



1. An apparatus for crushing wheel rims to facilitate removing the rims from the wheels comprising a generally horizontally disposed bed plate for placement within a metal compactor having two oppositely disposed, hinged crushing pads and between said crushing pads,

a wheel carriage having an upstanding crushing surface securely mounted upon said bed plate for supporting a wheel comprised of a tire and rim,

said carriage having a front wheel support and a rear wheel support upstanding therefrom on opposite sides of said crushing surface supporting said wheel vertically, and

two crushing pad points securely mounted on said pair of crushing pads,

said metal compactor having means for operating said crushing pad points downward and into said wheel and rim generally radially thereof, whereby said rim is crushed between said crushing pad points and crushing surface.

4,387,637

CONTAINER CRUSHING DEVICE

Leonard B. Baird, 505 Highland Ave. N., Jasper, Ala. 35501

Filed Aug. 14, 1981, Ser. No. 292,955

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—264 **8 Claims**

1. A device for crushing containers comprising:

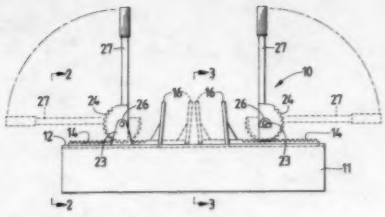
(a) a base having a supporting surface adapted to receive a container to be crushed,

(b) a pair of upstanding oppositely disposed crushing members mounted for rectilinear movement along said supporting surface selectively to a first position with said upstanding members being spaced from each other for receiving the container to be crushed and to a second position with said upstanding members being juxtaposed relative to each other to crush said container,

(c) an upwardly opening longitudinally extending recess in said supporting surface,

(d) a pair of elongated power transmitting members mounted for sliding movement within said recess with the innermost end of each said power transmitting member secured to the upstanding crushing member adjacent thereto, and

(e) a power transmitting element mounted for rotation above and operatively connected to each said elongated power



transmitting member and adapted to impart rectilinear movement thereto to move its upstanding crushing member selectively to said first position and to said second position.

4,387,638

DEVICE FOR REMOVING WATER FROM THE SOLVENT RECOVERY SYSTEM OF A FAST PRINTER

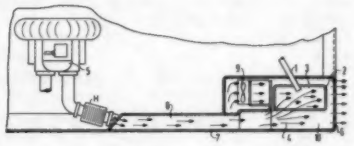
Gerhard H. Mueller, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 18, 1982, Ser. No. 340,293

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 3107279

Int. Cl.³ B41F *7/30*; B01D *47/00*

U.S. Cl. 101—1 **12 Claims**



1. Apparatus for removing water from a solvent recovery system of a printer assembly comprising an evaporation chamber contained within a printer assembly frame having a water evaporation tank means, a discharge pipe leading to said tank means for conducting a flow of recovered water from said solvent recovery system, a blower means in said printer assembly for generating a pressurized flow of dry air, air channel means in said printer assembly for conducting said pressurized flow through said evaporation chamber, and openings in said assembly frame leading from said evaporation chamber to ambient, whereby said pressurized flow is mixed with recovered water vapor in said evaporation chamber and this air-water vapor mixture passes through said openings to ambient.

4,387,639

MULTI-FUNCTION FINANCIAL DOCUMENT PROCESSOR

Charles R. Brown, Rosendale, N.Y.; Theodore J. Kohne, Uithoorn, Netherlands, and Donald C. Lancto, Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 83,494, Oct. 10, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,723

Int. Cl.³ B41L *47/46*

U.S. Cl. 101—2 **8 Claims**

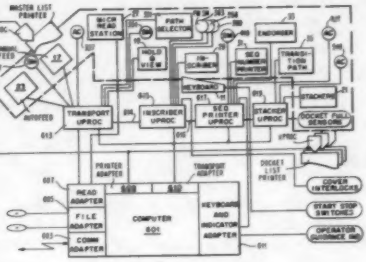
1. A multi-function document processor comprising:

a keyboard,

a document feed station substantially at the left of said keyboard;

a stacker substantially at the right of an operator seated before said keyboard and oriented at substantially 90 degrees in the horizontal plane with respect to a row of keys of said keyboard;

a document path from said feed station to a read station, said read station being located substantially behind said keyboard;



a print document path from said read station through a hold and view station positioned substantially between said read station and said keyboard;

a print station in said print document path between said hold and view station and said stacker; and

a sort document path between said read station and said stacker.

4,387,640

DEVICE FOR MARKING ARTICLES BY BRANDING

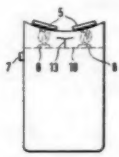
Dietmar Viol, Utting, Fed. Rep. of Germany, assignor to Fireprint AG, Heiden A-R, Switzerland

Filed Oct. 29, 1981, Ser. No. 316,284

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041964

Int. Cl.³ B44B 7/00

U.S. Cl. 101—9 **5 Claims**



1. A hand holdable vapor fuel device for marking articles by branding, particularly for marking the fibrous surface coat of a tennis ball, by means of at least one metallic symbol corresponding to the desired marking, the symbol being supported by holding means and adapted to be heated to the branding temperature by heating means, comprising: a casing having an open end face with edges, at least one symbol disposed at an open end face of said casing, the symbol projecting beyond two opposed casing edges, in a direction away from said casing, by an amount corresponding to the desired depth of branding, said casing being provided with a transverse wall, spaced from said open end face of said casing, said wall being provided with at least one nozzle aperture, comprising a burner of said heating means, directed towards said symbol, said casing containing a liquified gas tank and valve means in communication with said nozzle aperture, and an igniting mechanism for igniting gas issuing from said nozzle aperture and means for actuating said valve means and igniting mechanism from the exterior of the device.

4,387,641

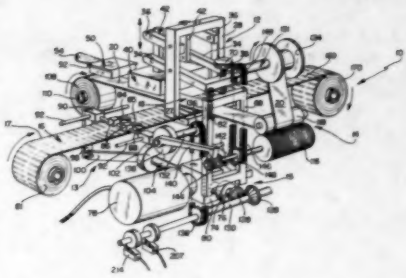
LABEL PRINTING APPARATUS

Morris Kortick, Cranston, R.I., assignor to A & H Mfg. Co., Johnston, R.I.

Filed Sep. 3, 1981, Ser. No. 299,002

Int. Cl.³ B41F 1/06

U.S. Cl. 101—27 **6 Claims**



1. An apparatus for printing a succession of labels, tags or the like comprising:

a. a base;

b. a printing pad mounted on said base;

c. a printing frame attached to said base and extending substantially upwardly therefrom;

d. a primary linkage arm pivotally attached to said frame, said primary arm including front and rear arm portions which extend forwardly and rearwardly respectively, the forwardly extending portion of said primary arm extending generally above said pad;

e. a secondary linkage arm pivotally attached to said frame, said secondary linkage arm being pivotal in substantially the same plane as said primary linkage arm and including a front arm portion that extends forwardly and that extends generally above said pad in substantially parallel spaced relation to said primary arm;

f. a print head;

g. means pivotally attached to the front arm portions of said primary and secondary arms and disposed generally above said pad for mounting said print head so that upward and downward pivotal movement of the rear portion of said primary arm moves said print head correspondingly to and from said pad in substantially parallel relation thereto;

h. a type element on said head directed toward said pad;

i. means attached to said head for heating said type element;

j. a cam element rotatably mounted on a substantially horizontal axis in the rear portion of said apparatus;

k. driven means for rotating said cam element;

l. a substantially vertically disposed cam follower frame which travels in a substantially vertical plane to provide mechanical communication between said rear arm portion and said cam element to cyclically move said rear arm portion up and down upon rotation of said cam element and to thereby cyclically reciprocate said head to and from said pad, said frame having a central aperture therein which is disposed in substantially aligned relation behind said pad;

m. means mechanically connected to said drive means for stepwisely advancing a succession of labels, tags or the like in aligned relation to said pad during the cyclical periods of said print head when said head is in spaced relation to said pad;

n. a thermographic strip interposed between said type element and the label, tag or the like at said pad; and

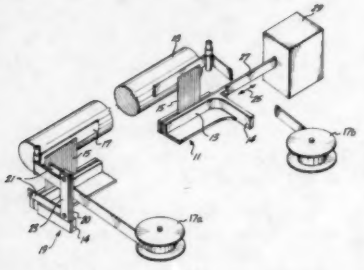
o. a strip feed assembly mounted in said apparatus to the rear of said frame and mechanically connected to said drive means for stepwisely advancing said thermographic strip rearwardly in substantially perpendicular relation to the movement of said labels, tags or the like, said strip feed assembly advancing said strip so that it moves rearwardly in said apparatus from said pad through the aperture in said frame without interference from said frame as it is reciprocated.

4,387,642

BI-DIRECTIONAL, CONSTANT VELOCITY, CARRIAGE SHUTTLING MECHANISMS

Edward D. Bringhurst, Seattle, and Swend L. Miller, Kent, both of Wash., assignors to Mannesmann Tally Corporation, Kent, Wash.

Filed Jul. 17, 1980, Ser. No. 169,595
Int. Cl.³ B41J 5/08
U.S. Cl. 101—93.04 **32 Claims**



1. A carriage shuttling mechanism comprising:
a first bi-lobed, second order elliptical element;
rotation means connected to said first bi-lobed, second order elliptical element for rotating said first bi-lobed, second order elliptical element at a constant speed;
a second bi-lobed, second order elliptical element identical in size to said first bi-lobed, second order elliptical element;
elliptical element connecting means for connecting said first and second bi-lobed, second order elliptical elements together such that said first and second bi-lobed, second order elliptical elements are 90° out-of-phase with one another; and
eccentric connecting means for eccentrically connecting said second bi-lobed, second order elliptical element to a carriage to be shuttled.

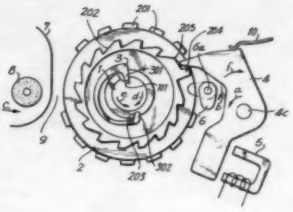
4,387,643

SMALL PRINTER

Hitoshi Mikoshiba; Kazuyoshi Fujimori; Kenji Onodera, and Shin Takeuchi, all of Shiojiri, Japan, assignors to Shinshu Seiki Kabushika Kaisha and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

Filed Dec. 28, 1981, Ser. No. 334,628
Claims priority, application Japan, Dec. 29, 1980, 55-187622
Int. Cl.³ B41J 1/44
U.S. Cl. 101—110 **11 Claims**

1. A small printer for printing characters in a row on a printing paper, comprising:
a plurality of character wheels positioned to provide column positions in said row, each said character wheel having characters on its peripheral surface,
a shaft rotatably supporting said character wheels thereon;
means for releasably engaging said character wheels individually with said shaft for rotation therewith;
means for selecting a character on each said wheel individually for printing, said selected characters being locked in a rotated position of said wheels for printing, locking a character in position for printing causing release of the associated character wheel from said rotational engagement with said shaft;
a plurality of actuating means, each said actuating means, when actuated, being capable of simultaneously operating



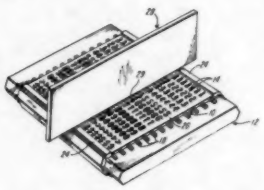
an associated group of at least two said selecting and locking means;
blocking means for intermittently preventing rotation with said shaft of all but one of said characters wheels in said associated group, said blocking means causing release of said all but one character wheels from said rotational engagement with said shaft.

4,387,644

FLEXIBLE ENDLESS PRINTING BAND

William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 189,672, Sep. 22, 1980, abandoned, which is a division of Ser. No. 951,342, Oct. 16, 1978, Pat. No. 4,263,242. This application May 20, 1982, Ser. No. 380,158
Int. Cl.³ B41J 1/20
U.S. Cl. 101—111 **9 Claims**



1. An endless printing band adapted to having a coating of color contracting material removed from visually readable characters by means of a wiping member, the printing band comprising a molded endless body of flexible material, said body including a first portion with a series of peripherally spaced and outwardly projecting printing characters and a second portion with a series of visually readable characters having outer surfaces, said second portion having a coating of a color contrasting with the color of the flexible material, said body further including a set of peripherally spaced guide bars positioned with said visually readable characters spaced between said guide bars, the guide bars extending in a lateral direction that crosses the peripheral direction, and said guide bars having flat outer surfaces free of characters and being coplanar with said outer surfaces of said visually readable characters when said body is mounted on a flat core blade for continuously guiding and supporting a wiping member during removal of the coating from said outer surfaces of said visually readable characters.

4,387,645

PRINTING MECHANISM

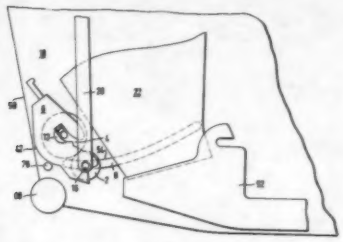
Günter Holland-Letz, Hirschhorn, and Klaus Dasting, Neckarsteinach, both of Fed. Rep. of Germany, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,802

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008165; Jun. 30, 1980, 3024800

Int. Cl.³ B41F *31/32*

U.S. Cl. 101—327 19 Claims



1. Printing apparatus for labelling devices and the like comprising a printing means movable between a retracted and a printing position, a roller holder means movable between an operable and a withdrawn position, said roller holder means comprising a holder structure having side walls and mounting a transfer roller and a supply roller, said roller holder means having a first spindle for said transfer roller and a second spindle for said supply roller, said side walls having slot means in which said second spindle is rotatably mounted, said slot means including a lower inner wall, a rocker arm pivotally connected to said roller holder means, said rocker arm being operable to move said roller holder means between said operable and said withdrawn positions as said printing means moves between said retracted to said printing positions, a casing having guide rails disposed adjacent to said roller holder means, and projections on said holder structure adapted to engage said guide rails as said roller holder means is moved from its operable towards its withdrawn position by said rocker arm, said projections being provided on said side walls approximately level with said slot means, said projections having planar surfaces aligned with said lower inner wall of said slot means.

4,387,646

DEVICE FOR INCREASING THE INK SUPPLY TO THE INKING UNIT OF A PRINTING MACHINE

Karel Hynst, Adamov, and Mojmir Travnicek, Blansko, both of Czechoslovakia, assignors to ZVS-Adamovske strojirny, koncernovy podnik, Prague, Czechoslovakia

Filed Jul. 29, 1981, Ser. No. 287,875

Claims priority, application Czechoslovakia, Jul. 31, 1980, 5351-80

Int. Cl.³ B41F *31/14, 31/12;* B41L *27/16*

U.S. Cl. 101—350 6 Claims

1. Apparatus for transferring ink from a doctor roller to an ink distributing roller in a printing machine, comprising:

a first rotatable shaft for rotating said doctor roller;

stationary cam means surrounding said first shaft and including a rotationally adjustable cam;

a ratchet wheel secured to and coaxial with said first shaft adjacent said stationary cam means;

a first hub rotatably mounted on and coaxial with said first shaft;

a pawl disk coaxial with said first shaft and secured to said first hub for rotation therewith, said pawl disk having a relatively large radius circumferential portion and a relatively small radius circumferential portion;

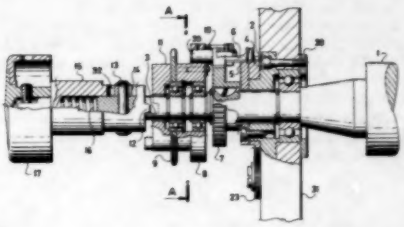
a second shaft parallel to said first shaft;

a rocking bent lever mounted on said second shaft and having a follower roller engaging the circumferential portions of said pawl disk, to cause said lever to oscillate when said first hub is continuously rotated;

an ink feed roller coupled to said rocking bent lever for osciliatory movement between contact with said doctor roller and contact with said ink distributing roller in response to the oscillation of said rocking bent lever;

a pawl for intermittently rotating said doctor roller, said pawl being secured to a peripheral part of said pawl disk via a pin for continuous rotation about the axis of said first shaft when said first hub is continuously rotated,

said pawl being rotatable about the axis of said pin and having (i) a cam folower portion riding on said cam means to cause said pawl to rotationally oscillate about said pin axis, and (ii) a ratchet wheel engaging part for



intermittently engaging the teeth of said ratchet wheel to rotate said ratchet wheel, first shaft and doctor roller as said pawl oscillates rotationally in accordance with the overall contour of said cam means, to intermittently rotate said doctor roller when said first hub is continuously rotated;

a second hub coaxial with and rotationally coupled to said first shaft for selectively engaging said first hub to couple said first hub to said first shaft, to cause said first shaft and said doctor roller to continuously rotate when said first hub is continuously rotated;

a first spring for biasing said second hub out of engagement with said first hub; and

manually operable means for moving said second hub into engagement with said first hub.

4,387,647

OFFSET PRINTING MACHINE INKING SYSTEM WITH SELECTIVELY ENGAGEABLE BYPASS ROLLERS

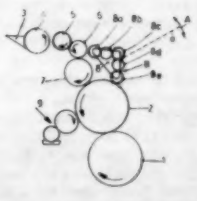
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 186,532, Sep. 12, 1980, abandoned. This application Feb. 3, 1982, Ser. No. 345,227

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942750

Int. Cl.³ B41F *31/30*

U.S. Cl. 101—350 12 Claims



1. An ink supply system for a rotary offset printing machine having

a plate cylinder (1),
means (3, 4) for furnishing printing ink;
an ink transfer roller train (2, 5, 6, 7) including a forme roller (2) in ink transferring engagement with the plate cylinder (1), an ink milling roller (6) and at least one ink transfer roller (5, 7) transferring ink between the ink furnishing means and the forme roller, and comprising
an additional ink transfer roller train unit (8, 10) having
a holder structure (8', 10);
an input roller (8a, 12);
an output roller (8a, 13);
and a plurality of intermediate rollers (8b–8d; 11) retained on the holder structure, the ink output roller (13) being in frictional engagement with and in ink transfer relation to the forme roller;
and means (a, b, 11') for moving the holder structure (8', 10) and with it the ink input roller (8a, 12) and the intermediate rollers, selectively, between a position in which the input roller is in or out of engagement with another one of the rollers (6, 7) of the ink transfer roller train, as a unit, the output roller (8a, 13) remaining in frictional engagement with the forme roller to provide, selectively,
(a) a second path of ink from the ink furnishing means to the forme roller, or
(b) a plurality of rollers in engagement only with the fluid from the forme roller.

4,387,648

INK METERING WITH INDIVIDUAL INK KNIVES RESPECTIVELY EXTENDING OVER THE ENTIRE WIDTH OF THE INKING ZONES

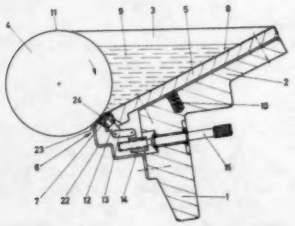
Willi Jeschke, Heidelberg; Rudi Junghans, Wilhelmsfeld; Hermann Beisel, and Günther Hofmann, both of Walldorf, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jun. 12, 1980, Ser. No. 158,785

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1979, 2923678

Int. Cl.³ B41F *31/02*

U.S. Cl. 101—365 **10 Claims**



1. Ink duct for offset or letterpress printing machines with an ink metering unit formed of a plurality of zone-wide metering elements disposed closely adjacent one another and adjustable to zonally varying ink-gap thicknesses, and an ink duct roller forming part of the ink duct, comprising means for providing a support and means for metering formed on the metering elements, said support means being constantly in at least indirect contact under spring pressure with the ink duct roller, said support means also being formed with an ink flow-through passage of a size affording adequate flow of ink therethrough even for an adjusted maximum ink-gap thickness, each of the metering means of the respective metering elements extending over the entire respective zone width, the respective metering means being connected to said support means and, as viewed in rotary direction of the ink duct roller, being disposed downstream from said ink flowthrough passage and at such a spacing behind said support means that ink located between said support means and said metering means can spread axially and distribute uniformly over the entire zone width, respectively.

4,387,649

ELECTRICAL PROJECTILE DETONATOR

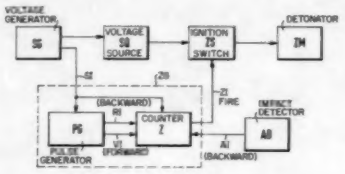
Peter Weidner, Breitenbrunn, and Harald Wich, Kulmbach, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,828

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 2940227

Int. Cl.³ F42C *9/00, 11/06*

U.S. Cl. 102—215 **6 Claims**



1. In an electrical projectile detonator including a voltage source, an impact detector, a timing circuit, and an ignition switch coupled between said voltage source and a detonator, said timing circuit being coupled to said impact detector and said ignition switch, said timing circuit including a forward-backward counter and a pulse generator coupled to said counter for generating forward and backward counting pulses, with the frequency of the forward counting pulses being less than the frequency of the backward counting pulses, said counter being activated in the forward counting mode upon firing of the projectile and generating a firing signal to said ignition switch to detonate said detonator upon the counter reaching a given high count, said impact detector activating said counter in a backward counting mode upon the occurrence of an impact by the projectile to cause the counter to count backward, from the count previously reached in the forward counting mode, at the higher frequency of the backward counting pulses to generate a firing signal to said ignition switch to detonate said detonator upon the counter reaching a given low count.

4,387,650

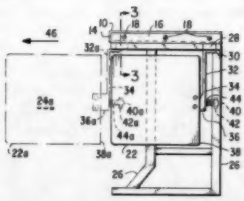
STORABLE TABLE

Domenico Pizzi, 18 Kashey St., Clifton, N.J. 07013

Filed Feb. 5, 1981, Ser. No. 231,650

Int. Cl.³ A47B *3/00*

U.S. Cl. 108—40 **4 Claims**



1. A storable table comprising a longitudinal track fastened horizontally to a supporting vertical structure, a longitudinal slot extending the entire length of the lowermost surface of a cavity in said track, said cavity extending the length of said track, a slideable support member within said cavity substantially shorter than the entire length of said track, and L-shaped bracket having a leg depending vertically downwards from the lowermost surface of said slideable support member, a shelf member, detenting means to removeably detentingly engage said shelf member to said L-shaped bracket in a selected one of a plurality of positions wherein a lateral surface of said shelf

member is disposed in one of a plurality of planes, biasing means for urgingly and disengageably engaging a portion of said detenting means in any of said plurality of postions including detenting means whereby said lateral surface of said shelf is free to rotate in any plane when said biasing means are overcome wherein said detenting means comprises a plurality of pins, said pins being secured to said shelf in uniform spaced apart relationship about a bolt circle, a plurality of pin receiving holes, said pin receiving holes located in said leg and spaced apart uniformly about another bolt circle, said bolt circle and said another bolt circle having the same diameter, wherein said biasing means comprise a rod, a helical spring, said helical spring being disposed about a first portion of said rod, a second portion of said rod being disposed engaged with said leg, a block, said block being disposed secured to said shelf, a third portion of said rod being disposed secured to said block whereby said spring urges an adjacent surface of said block towards an adjacent surface of said leg, wherein said second portion of said rod is slideably and rotationally engaged with said leg, wherein said plurality of pins includes four pins, each of said pins being disposed defining the four corners of a square and wherein said four pins engage all of said pin receiving holes when said block is detentingly engaged with said adjacent surface of said leg.

4,387,651

REMOVABLE SEAL PLATES

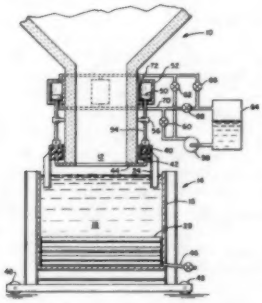
Richard F. Moore, Tolland, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

PCT No. PCT/US81/00012, § 371 Date Jan. 2, 1981, § 102(e) Date Jan. 2, 1981, PCT Pub. No. WO82/02425, PCT Pub. Date Jul. 22, 1982

PCT Filed Jan. 2, 1981, Ser. No. 273,891

Int. Cl.³ F23J *1/02*

U.S. Cl. 110—171 **4 Claims**



1. An ash-disposal system for ashes discharged from a coal-fired or other ash-bearing fuel-fired combustion chamber, including opening means in the furnace bottom, a tank opened at its upper end and containing water positioned beneath the opening means, into which the ash from the combustion chamber falls, means for removing the ash from the tank, a water seal between the furnace bottom and the tank for sealing the furance interior from exposure to the atmosphere, the water seal including plate means movably attached to and extending down from the furnace bottom, which plate means completely surrounds the opening means, said plate means having first and second positions, the first position being such that the plate means extend down into the water within the tank at their lower ends, said opening means in the furnace bottom having an annular ring attached to it, and said plate means having a resilient seal attached to it, which resilient seal is in sealing contact with the ring when the plate means is in its first position, and the second position being such that the tank is located beneath the plate means and the resilient seal is not in sealing relationship at the upper end with the opening means ring in the furnace bottom, and means for moving the plate means between the first and second positions.

4,387,652

FURNACE

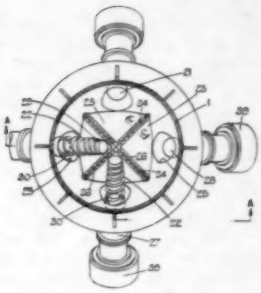
Jeremy C. R. Cooke, Edgbaston, and Frederick H. Tilley, Broxbourne, both of England, assignors to Foster Wheeler Power Products Limited, London, United Kingdom

Continuation of Ser. No. 147,592, May 7, 1980, abandoned. This application Feb. 11, 1982, Ser. No. 347,936

Claims priority, application United Kingdom, May 9, 1979, 7915987

Int. Cl.³ F23G *5/04*

U.S. Cl. 110—224 **14 Claims**



8. A furnace for heating pieces of solid material, comprising:

(a) a vertically extending housing having a longitudinal axis,

(b) a closure portion disposed on the lower end of said housing,

(c) means for feeding solid material into an upper portion of said housing,

(d) means for supplying a heating gas to the interior of said housing to heat solid material disposed within the housing,

(e) and means assisted by gravity for removing heated solid material from said housing and downwardly through said closure portion,

(f) said last-named means including at least one screw conveyor extending from the exterior of said furnace and upwardly at an incline to said axis and through said closure portion so that the inner conveyor end is disposed at a higher location within said housing than the part of said conveyor which passes through said closure portion, and a trough disposed below said screw conveyor and inclined at substantially the same angle as said screw conveyor, said trough having a pair of edges which converge upwardly to an apex.

4,387,653

LIMESTONE-BASED SORBENT AGGLOMERATES FOR REMOVAL OF SULFUR COMPOUNDS IN HOT GASES AND METHOD OF MAKING

Kenneth E. Voss, Somerville, N.J., assignor to Engelhard Corporation, Edison, N.J.

Division of Ser. No. 175,227, Aug. 4, 1980, Pat. No. 4,316,813. This application Oct. 5, 1981, Ser. No. 308,868

Int. Cl.³ F23B *7/00*

U.S. Cl. 110—342 **6 Claims**

1. In a process for fluidized bed combustion of sulfur containing fuel such as coal or heavy oil, wherein said fuel generates sulfur oxides in the flue gas stream upon combustion, and limestone is added to said bed to react with said sulfur oxides to remove them from the flue gas stream, the improvement which comprises enhancing the removal of sulfur oxides by utilizing said limestone in the form of agglomerates comprising

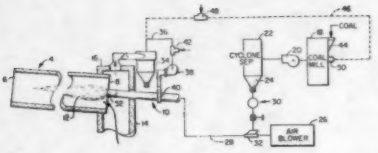
fine grains of naturally occurring, uncalcined limestone and a cementitious clay selected from the group consisting of attapulgite, sepiolite, smectite and mixtures thereof in binder-effective amount.

4,387,654

METHOD FOR FIRING A ROTARY KILN WITH PULVERIZED SOLID FUEL

Chester S. Binasik, Palo Alto, and Louis D. Siegert, Burlingame, both of Calif., assignors to Coen Company, Inc., Burlingame, Calif.

Division of Ser. No. 146,810, May 5, 1980, Pat. No. 4,310,299. This application Sep. 2, 1981, Ser. No. 298,825
Int. Cl.³ F23D 1/00
U.S. Cl. 110—347 15 Claims



1. A method for firing a coal burner for a kiln comprising the steps of: providing pulverized coal at a predetermined rate which corresponds to the desired rate with which pulverized coal is combusted in the kiln; pneumatically transporting the pulverized coal to the burner with an amount of primary combustion air of at most about 5% of the theoretical amount of air needed to combust the pulverized coal; forming a supplemental primary combustion airflow measured so that the primary combustion airflow and the supplemental primary combustion airflow comprise at most about 20% of the theoretical amount of air needed to combust the pulverized coal; heating the supplemental primary air to a temperature of at least about 600° F.; combining the primary combustion airflow and the pulverized coal entrained therein with the supplemental primary combustion airflow to form a coal-airstream at the burner; flowing the coal-airstream over a sufficient distance so that volatiles in the pulverized coal in the stream are driven off; thereafter igniting the coal-airstream to form a flame directed into the kiln; generating a secondary combustion airstream for providing the balance of combustion air required for fully combusting the pulverized coal in the stream; heating the secondary combustion air with product discharged from the kiln to a temperature of at least about 800° F.; and mixing the secondary combustion air with pulverized coal discharged into the kiln to effect the full combustion of the pulverized coal.

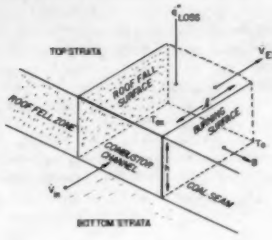
2. A method for firing a coal burner for a kiln comprising the steps of: providing pulverized coal; establishing an airflow of not substantially more than 5% of the theoretical amount of air needed to combust the pulverized coal in the kiln; entraining pulverized coal in the airflow at a predetermined rate which corresponds to the desired rate with which pulverized coal is combusted in the kiln to thereby form a pulverized coal flow; mixing the coal flow with an amount of supplemental, primary air to establish a coal-airstream having no more than about 20% of the theoretical amount of air needed to combust the pulverized coal in the kiln; directing the coal-airstream through a burner tube; heating the supplemental primary air to a sufficient temperature and retaining the coal-airstream in the burner tube for a sufficient length of time to vaporize in the coal-airstream volatiles present in the coal; thereafter discharging the stream from the burner tube into the kiln; igniting the stream; and introducing sufficient secondary air having a temperature of at least about 800° F. into the kiln and in substantially surrounding relationship to the stream discharged into the kiln so as to substantially completely combust the pulverized coal in the kiln.

4,387,655

METHOD FOR CONTROLLED BURNOUT OF ABANDONED COAL MINES AND WASTE BANKS

Robert F. Chaiken, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 209,173, Nov. 21, 1980, abandoned. This application May 10, 1982, Ser. No. 376,852
Int. Cl.³ F23D 1/00
U.S. Cl. 110—347 5 Claims



1. A process for recovering energy from in situ wasted coal located at or adjacent to the area from which mined comprising the steps of:

(a) creating at least one channel through the in situ wasted coal without removing the wasted coal from its location at or adjacent to the mining area;

(b) igniting the wasted coal in said channel while at the same location to cause subsurface in situ combustion to occur;

(c) activating gas control means to subject said wasted coal, at least in said channel, to a controlled negative gaseous pressure drop relative to ambient gaseous pressure applied to a preselected zone;

(d) connecting said wasted coal, at least in said channel, to a source of air remote from said preselected zone to induce the air to permeate through the wasted coal to the channel and thereby in step (b) produce hot gaseous products of combustion, said products being drawn to said zone;

(e) drawing the hot gaseous products of combustion through an afterburner from the preselected zone, air and fuel being added thereto in said afterburner in an amount sufficient to produce essentially complete stoichiometric combustion of the gaseous products of combustion; and

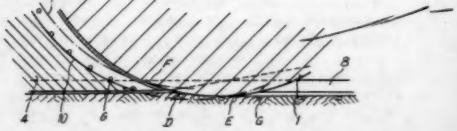
(f) thereafter utilizing said hot gaseous products of combustion in a heat exchange relationship to recover the heat energy therefrom.

4,387,656

PRECISION SOWING SEED DRILL

Paul Herriau, Cambrai, France, assignor to Societe Sogefina, Societe de Gestion Financiere Armoricaine, Paris, France

Filed Mar. 31, 1981, Ser. No. 249,363
Claims priority, application France, Mar. 31, 1980, 80 07189
Int. Cl.³ A01C 5/00
U.S. Cl. 111—86 4 Claims



1. A seed distributor of the type comprising for each furrow

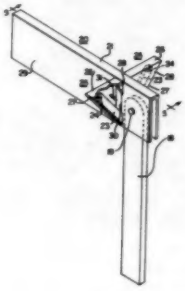
a ploughshare for opening the furrow, a pneumatic transport channel for seeds ending in the furrow, and a setting wheel sinking the seeds distributed in the furrow, the terminal part of the pneumatic transport channel being directed toward the apex of the dihedral formed by the lower forward peripheral surface of the setting wheel with the bottom of the furrow and terminating within the furrow adjacent the bottom of the furrow and directly beneath a portion of the periphery of the setting wheel that is within the furrow, whereby when seeds are released under the action of air pressure from the pneumatic transport channel they are immediately captured in the nip formed by the setting wheel periphery and the bottom of the furrow to be depressed into the bottom of the furrow in spaced relation.

4,387,657

CENTERBOARD SNUBBER

Bayard K. Saunders, 2685 Woodside Rd., Bethlehem, Pa. 18017

Filed Jul. 27, 1981, Ser. No. 287,292
Int. Cl.³ B63B *41/00*
U.S. Cl. 114—132 **4 Claims**



1. A centerboard snubber for use with a weighted centerboard or swing keel equipped sailboat, the centerboard snubber being equally effective with both weighted centerboards and swing keels for blocking retraction of said weighted centerboard or swing keel into its trunk only upon excessive heeling of the sailboat comprising

a pair of snubbers one on each side of said trunk and pivotally mounted at one end,

said snubbers being transversely disposed with respect to said trunk and each of said snubbers being swingable upon excessive heeling of said sailboat to a position to block said centerboard or swing keel from retracting into said trunk,

said snubbers being mounted within snubber housings,

said snubber housings having members for limiting outward swinging movement of said snubbers,

said snubber housings having members for limiting inward swinging movement of said snubbers.

4,387,658

WHEEL STEERING APPARATUS FOR BOATS

Theodore Elliott, 384 Summer St., Manchester, Mass. 01944

Continuation of Ser. No. 863,061, Dec. 21, 1977, abandoned, which is a continuation of Ser. No. 700,878, Jun. 29, 1976, abandoned. This application Jan. 19, 1982, Ser. No. 340,667
Int. Cl.³ B63H *25/10*
U.S. Cl. 114—144 R **1 Claim**

1. A wheel steering apparatus to be mounted to the cockpit sole of a sailboat in which the sailboat includes a rudder, a rudder post with one end connected to the rudder and means on the cockpit sole for supporting, in an exposed position above the cockpit sole, the other end of said rudder post, said apparatus comprising:

A. sheave means including a sheave mounted to the exposed end of the rudder post in a plane that is normal thereto;

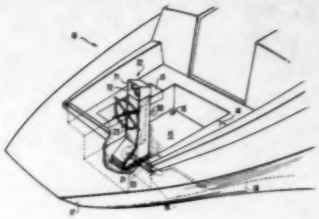
B. a housing mounted to the cockpit sole, said housing having a base portion for enclosing said sheave means and an upstanding hollow pedestal portion;

C. a shaft mounted in said pedestal portion of said housing;

D. a steering wheel mounted to said shaft for rotating said shaft;

E. drive means connected to said shaft for rotation with said steering wheel and shaft;

F. linkage means partially located in said pedestal portion for interconnecting said drive means and said sheave means,



said sheave means including connection means for affixing said linkage means to said sheave in a positive driving relationship, and

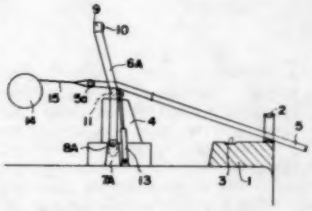
G. directing means mounted to said housing for orienting said linkage means to lie substantially normally to said shaft and to lie substantially in the plane of said sheave at said sheave means, said directing means maintaining said linkage within a beam dimension that is a maximum across said sheave whereby said housing encloses said sheave means and said linkage means thereby to provide a completely enclosed, compact steering apparatus for the sailboat.

4,387,659

DEVICE FOR ENGAGING AND DISENGAGING CABLE

Kazuo Terauchi, Sakai, and Masatoshi Fukuta, Ohtsu, both of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Jun. 24, 1981, Ser. No. 277,059
Claims priority, application Japan, Jul. 18, 1980, 55-102566
Int. Cl.³ B63B *21/08*
U.S. Cl. 114—199 **1 Claim**



1. A device for engaging and disengaging a line comprising a pair of pivotal arms turnable to an upright position and to a horizontal position and supported at a location close to a line engaging bitt opposed to and a distance away from a line guiding member, a pressing traverse arm extending between the free ends of the pivotal arms, a disengaging traverse arm extending between intermediate portions of the pivotal arms for disengaging the line from the bitt, means for turning the pivotal arms to the upright position and to the horizontal position, and a pressing bed positioned to oppose the pressing

traverse arm when the pivotal arms are turned to the horizontal position, the disengaging traverse arm being positionable above the bitt when the pivotal arms are in the upright position, the traverse arms and the pivotal arms defining a space for inserting the line therethrough.

4,387,660

SINGLE POINT MOORING

Rene Loire, San Francisco, Calif., assignor to Morrison-Knudsen Company, Inc., Boise, Id.

Continuation of Ser. No. 58,305, Jul. 17, 1979, abandoned. This application Jul. 10, 1981, Ser. No. 281,988

Int. Cl.³ B63B *21/00*

U.S. Cl. 114—230 **9 Claims**

1. A single point mooring comprising a tubular base member which rests on the ocean bottom along its length and consists essentially of a plurality of floodable compartments, a tubular cross member rigidly joined to one end of the base member in the plane of the base member at a point intermediate the ends of the cross member and consisting essentially of a plurality of separately floodable compartments, and which rests on the ocean bottom along its length, and a mooring post member rigidly joined to the end of the base member remote from the cross member and projecting upward perpendicular to a plane intersecting the base member and cross member.

8. The method of positioning a single point mooring structure including an elongated keel-like member having two ends which comprises floating the structure, adjusting the bouyancy of the structure to sink the elongated keel-member into the water, towing the structure to a point short of the point of use, ballasting the structure to cause the rear end of the keel-like member to touch lightly on the bottom of the ocean while maintaining the forward end of the keel-like member clear of the bottom, continuing to tow the structure to the point of use, and then ballasting the structure further such that both ends of the keel-like member rest on the bottom.

4,387,661

AMPHIBIOUS MOTOR-DRIVEN CYCLE

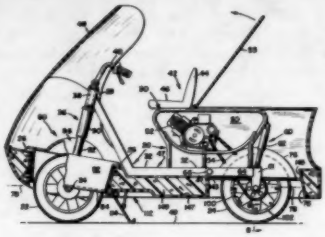
Kenneth R. Duff, 7729 Dolly Dr., Lorton, Va. 22079

Continuation of Ser. No. 109,226, Jan. 3, 1980, abandoned. This application Oct. 19, 1981, Ser. No. 312,842

Int. Cl.³ B63B *35/00*

U.S. Cl. 114—270 **23 Claims**

1. A two-wheeled amphibious cycle adapted for both land and water travel and comprising a frame, a vehicle steering front wheel unit supported by said frame and including (a) means rotatably mounting said front wheel and supported on said frame for manual rotation about a steering axis for steering the cycle on land, a motor-driven ground-engaging rear wheel rotatably supported from said frame, a floatation hull rigid with said frame, and seat means mounted on the assembly of said hull and said frame for occupancy by the driver of the amphibious cycle, said front and rear wheels being disposed one behind the other and protruding below the bottom of said hull for engagement with a ground surface during land travel, said hull being provided with downwardly opening front and rear wheel wells which define substantially watertight continuations of the bottom of said hull at least below the water line of said hull, and said front and rear wheels being partially received in said front and rear wells, respectively, said front wheel extending freely through an opening in the bottom of said hull, and said front wheel well being formed by a unit



which is carried by a part of said front wheel mounting means and which provides a substantially watertight seal opposing entry of water into the hull through said opening, but allows unimpeded turning movement of the front wheel for steering the amphibious cycle on land.

4,387,662

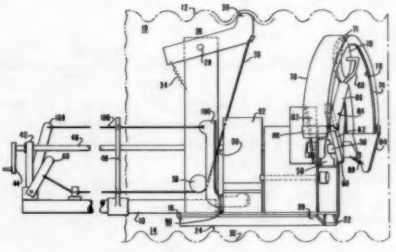
CORRUGATED PIPE ADHESIVE APPLICATOR APPARATUS

Ray A. Shirey, North Grafton, Mass., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 3, 1982, Ser. No. 354,486

Int. Cl.³ B05C *7/08*

U.S. Cl. 118—105 **10 Claims**



1. Apparatus for coating selected portions of the troughs of a corrugated pipe with an adhesive comprising:

a support disposed in said pipe;

a reservoir containing said adhesive disposed on said support;

pump means including a spout for supplying said adhesive from said reservoir to a trough of said pipe, said pump means being disposed on said support with said spout being aligned with said trough;

a rotatable applicator supported by said support and contacting said trough, said applicator being sized so as to fit within said trough, said applicator contacting said adhesive in said trough and spreading said adhesive in said trough upon rotation;

means for rotating said applicator;

shield means supported by said support and disposed in the path of rotation of said applicator for preventing said applicator from contacting selected portions of said trough; and

locator means disposed on said support for aligning said

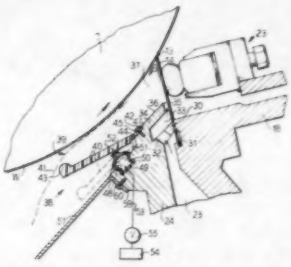
spout, said applicator, and said shield means with said trough.

4,387,663

BLADE TYPE FOUNTAIN COATER METERING DEVICE

Robert J. Albeid, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 7, 1981, Ser. No. 309,189
Int. Cl.³ B05C *3/02*
U.S. Cl. 118—413 **10 Claims**



1. In a fountain coating applicator especially suitable for paper web coating and including a generally upwardly projecting doctor blade having an upper edge for coating nip relation across the width of a web travelling continuously on backing surface means, means for delivering coating material, and means extending across the width of the web for supplying the coating material from said delivering means under hydraulic pressure to said coating nip within a coating application pond chamber defined in part by said doctor blade and said web running on said backing surface means and in addition by an application chamber floor area of substantial length spaced below said nip, the improvement comprising:

pond pressure controlling means mounted on said floor area intermediate upstream and downstream edges of said floor area and adjustably moveable from and relative to said floor area for providing an adjustable outlet orifice for said chamber, said controlling means being spaced from said blade at an upstream location relative to the direction of travel of said web;

and pressure fluid responsive means for selectively adjusting said pond pressure controlling means for attaining a desired orifice dimension.

4,387,664

DEVELOPING APPARATUS FOR ELECTROSTATIC IMAGE

Nagao Hosono, Shizuoka; Koichi Kinoshita, Narashino, and Toru Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

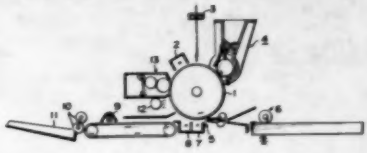
Division of Ser. No. 267,771, May 28, 1981, which is a continuation of Ser. No. 938,494, Aug. 31, 1978, abandoned. This application Jan. 18, 1982, Ser. No. 340,298
Claims priority, application Japan, Sep. 10, 1977, 52-109240; Sep. 10, 1977, 52-109241
Int. Cl.³ G03G *15/09*
U.S. Cl. 118—658 **17 Claims**

1. A developing apparatus for forming a developed image, comprising:

developer supporting means having a support surface upon which developer may be moved to a developing zone at which said developer supporting means faces a member to which developer is to be transferred for developed image formation;

means for supplying magnetic developer to said support surface;

magnetic field producing means so arranged that in use a portion of the developer supporting means lies between said magnetic field producing means and said developer carried on said support surface, and a stationary magnetic field produced thereby extends across said portion of said developer supporting means through said support surface to attract developer to said support surface; and



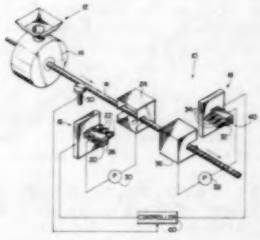
magnetic means closely spaced from said support surface and disposed within the stationary magnetic field, said magnetic means being adapted and arranged to cooperate with said magnetic field produced by said magnetic field producing means to limit the thickness of the developer carried on said support surface to the developing zone.

4,387,665

ELECTRONIC BAND MARKING CONTROLLER

Henry H. Clinton, 10 Shore Rd., Clinton, Conn. 06413

Filed Aug. 10, 1981, Ser. No. 291,612
Int. Cl.³ B05B *3/14*
U.S. Cl. 118—674 **14 Claims**



1. In an apparatus for producing marking bands at spaced intervals along a wire or like object and including cyclically driven dispensers for applying marking material to different sides of the wire and at longitudinally spaced stations along the wire and speed sensing means for sensing the speed of movement of the wire longitudinally relative to the dispensers and generating a synchronous speed signal for operating the dispensers, an improved controller responsive to the speed signal and connected in driving relationship with the cyclically driven dispensers comprising:

phasing circuit means connected with the speed sensing means for generating from the synchronous speed signal two additional speed signals synchronous with the speed signal and fixed in phase relationship with each other;

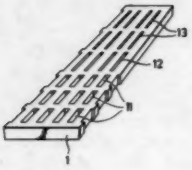
adjustable phase selecting means connected with the phasing circuit means and having two inputs respectively receiving the additional speed signals and two outputs providing respectively two further synchronous speed signals of selected phase relationship; and

two drive amplifiers connected respectively in driving relationship with two cyclically driven dispensers and responsive respectively to the two further synchronous speed signals of selected phase relationship.

4,387,666
PIG BOX GRATING

Heinrich Thye-Lokenberg, D-2845 Neuenkirchen i.Old., Fed. Rep. of Germany

Continuation of Ser. No. 75,632, Sep. 14, 1979, abandoned. This application May 15, 1981, Ser. No. 263,951
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1978, 2840395; Jun. 23, 1979, 2925464
Int. Cl.[3] A01K *1/02*
U.S. Cl. 119—28 10 Claims

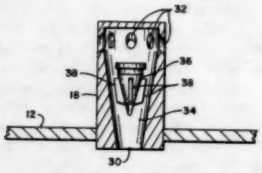


1. A base for resting on spaced supports for the accommodation of suckling sows and piglets, comprising a plurality of grids each made in one piece, said grids each including a plurality of apertures spaced from each other along the entire length and width thereof, the apertures being arranged in at least three groups distributed in the lengthwise direction of the grids, the width of all of the apertures within each group being the same for that group, the width of the apertures of each group being different from the width of the apertures of each other group, the grid having apertures of relatively larger width within the range 20 to 30 millimeters in the location of the base to be occupied by sows so that faeces and urine can readily pass through the grid apertures, the grid having apertures of relatively lesser width in two groups in the location of the base to be occupied by piglets, a first of said groups of the piglet location having an aperture width of about 6 millimeters, and a second of the said groups of the piglet location having an aperture width of about 9 millimeters.

4,387,667
FLUIDIZED BED DISTRIBUTOR PLATE ASSEMBLY

Stephen L. Goodstine, Windsor, and Glen D. Jukkola, Wethersfield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 14, 1981, Ser. No. 330,291
Int. Cl.[3] F22B *1/00*; F26B *3/08, 17/00*; F16K *15/04*
U.S. Cl. 122—4 D 4 Claims

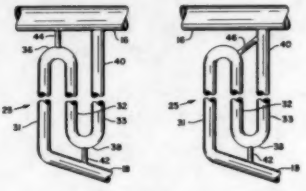


1. In combination, a fluidized bed including a housing, an air distributor extending across the housing, means for introducing particulate matter onto the upper surface of the air distributor, the air distributor including a flat plate, a plurality of nipples extending upwardly from the upper surface of the plate with passage means extending up through each nipple, each passage means having inner walls forming a frustoconical passage, larger at its upper end, restriction means within each passage means, which restriction means floats freely within the passage in such a manner that as the flow velocity of the air therethrough increases, the restriction means is automatically forced higher in the passage thus increasing the flow area therearound, and keeping the pressure drop across the restriction means fairly constant, each restriction means having a plurality of ribs attached to its outer surface, and the lower inlet walls of each passage means is sized such that the ribs seat in the inlet on point contact therewith.

4,387,668
TUBE ARRANGEMENT FOR FURNACE WALL

Edward L. Kochey, Jr., Colebrook, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 28, 1981, Ser. No. 335,005
Int. Cl.[3] F22B *37/00*
U.S. Cl. 122—6 A 3 Claims

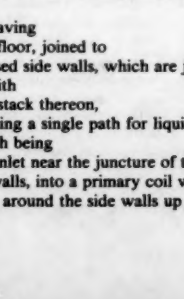


1. A furnace wall tubing arrangement for the upper end of a spiral wound boiler furnace comprising: an outlet header; a vertically sinuous tube extending upwardly in the furnace wall from each spiral wound tube to said outlet header, and including an upper return bend and a lower return bend; a first flow connecting means fluidly connecting the bottom of each lower return bend to the respective spiral wound tube, said first flow connecting means having substantially less flow area than said sinuous tube; and a second flow connecting means fluidly connecting the top of each upper return bend to said header, said second flow connecting means having substantially less flow area than said sinuous tube.

4,387,669
HEATER

Billy G. Brown, Levelland, Tex., assignor to Murrell's Welding Works, Inc., Levelland, Tex.

Filed Mar. 29, 1982, Ser. No. 362,913
Int. Cl.[3] F22B *29/02*
U.S. Cl. 122—235 A 12 Claims



1. An oil field heater for heating produced liquid comprising in combination:

a. a housing having
   (i) a closed floor, joined to
   (ii) four closed side walls, which are joined to
   (iii) a top with
   (iv) a short stack thereon,

b. tubing forming a single path for liquids within the housing, said path being
   (i) from an inlet near the juncture of the floor and one of the side walls, into a primary coil which is
   (ii) helically around the side walls up to the stack,

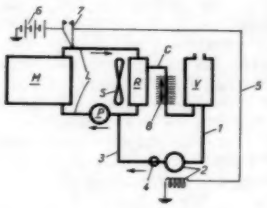
(iii) and from the top of the primary coil into the top of a secondary coil which is a bundle formed of
(iv) a series of spaced apart horizontal layers,
(v) each layer including a series of spaced apart tubes, and
(vi) from the bottom of the secondary coil to an outlet near the junction of the floor and one of the side walls,
c. said primary coil spaced from each of the four side walls thus forming four air passageways, one passageway between the primary coil and each of the four walls, and
d. a blower at the top of each air passageway to blow combustion air to
e. a burner located in
f. a fire box above the floor and below the bottom of the secondary coil,
g. so that the four side walls are separated from the fire box by the primary coil and the air passageways.

4,387,670

COOLING SYSTEMS FOR INTERNAL COMBUSTION ENGINE COMPRISING A RADIATOR EQUIPPED WITH AN EXPANSION-TANK

Roger Robin, Elencourt, and Ngy S. Ap, Montfermeil, both of France, assignors to Valeo, Paris, France

Filed May 19, 1981, Ser. No. 265,253
Claims priority, application France, May 20, 1980, 80 11227
Int. Cl.³ F01P 7/16
U.S. Cl. 123—41.08 **8 Claims**



1. Method for preventing overheat of relatively hot coolant liquid of an automobile engine upon sudden drop of ventilation due to either slow down or stop of the automobile after intense running, which coolant liquid is contained in a cooling hydraulic circuit comprising on the one hand a loop including in series flow relationship a circulating pump, said engine and a ventilated radiator and on the other hand an external expansion tank in a hydraulic circuit branch extending from said loop and containing an amount of relatively cold coolant liquid, said method comprising the steps of:
sucking relatively cold coolant liquid from the expansion tank externally of said loop; and
pumping the sucked relatively cold coolant liquid into the relatively hot coolant liquid in the loop of the hydraulic circuit at an injection location thereof between the radiator and the engine.

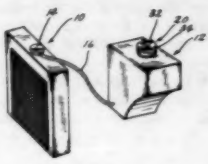
4,387,671

AIR FILTER FOR A COOLING SYSTEM OVERFLOW CONTAINER

Robert D. Jarvis, 5747 S. 148th Ct., Omaha, Nebr. 68137

Filed Jul. 13, 1981, Ser. No. 283,068
Int. Cl.³ F01P 11/02; B01D 46/10
U.S. Cl. 123—41.27 **1 Claim**

1. In combination with a vehicle engine cooling system containing a coolant,
an overflow container fluidly connected to the cooling system, said container having a fill opening formed therein adjacent the upper end thereof which is in communication with the atmosphere to permit air in the container to pass outwardly therethrough when coolant from the cooling system is overflowing thereinto and to permit air to pass inwardly therethrough when the coolant in the container is being drawn into the cooling system,
and an air filter means extending across said opening whereby the air entering said container will pass through said filter means and will be filterd to remove foreign substances carried thereby,
a closure means removably mounted on said fill opening to close the same, said filter means being operatively mounted on said closure means, said closure means having air openings formed therein to permit the air to pass therethrough,



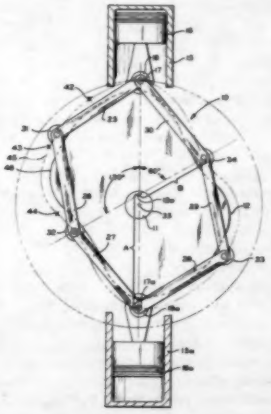
said closure means comprising an annular skirt portion which is threadably mounted on said container, a top portion extending over said skirt portion, said top portion having a plurality of the said air openings formed therein to permit air to pass therethrough, said filter means being positioned over said top portion, and means maintaining said filter means on said top portion,
said closure means having an upstanding annular ridge extending therearound which partially embraces said filter means,
said annular ridge having a plurality of slits formed therein to permit coolant to pass outwardly therethrough in the event that coolant should overflow from said container.

4,387,672

ENERGY TRANSFER APPARATUS

Alfred J. Crocker, 4906 Naomi Dr., Toledo, Ohio 43623

Filed Oct. 8, 1981, Ser. No. 309,824
Int. Cl.³ F02B 75/22
U.S. Cl. 123—55 AA **3 Claims**



1. An apparatus for transferring energy, comprising:
(a) at least two cylinders;
(b) a piston reciprocably mounted within each of said cylinders;
(c) a rotary shaft;
(d) cam means connected to said shaft for rotation therewith, said cam means having a profile defined by a major and a

minor diameter having coincident centers, said coincident centers displaced from the axis of said rotary shaft, said cam profile having at least two identical profiles for reciprocating said pistons at least twice in one revolution of said shaft;

(e) follower means following the profile of said cam means, said follower means including at least six equally spaced rollers and six equal length links with adjacent rollers being interconnected by one of said links, at least two of said links being elongatable in length and including a pair interconnected members having overlapping portions movable relative to each other and a spring member coupled to the overlapping portions tending to resist elongation of said pair of interconnected members; and

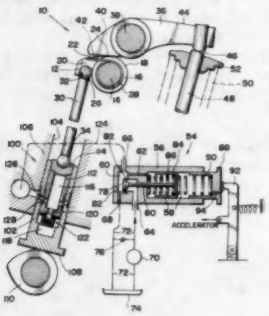
(f) means connecting said pistons to said follower means whereby one of said pistons is juxtaposed the top of its associated cylinder by one of said identical profiles and another of said pistons is displaced from the top of its associated cylinder by another of said identical profiles.

4,387,673

VALVE OPENING CONTROL DEVICE

Shunichi Aoyama, Yokohama, and Eiji Murata, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 13, 1980, Ser. No. 159,324
Claims priority, application Japan, Jun. 14, 1979, 54-74994
Int. Cl.³ F01L *1/34*
U.S. Cl. 123—90.16 **5 Claims**



2. A system for regulating the opening of an internal combustion engine cam-operated cylinder valve in response to the position of an external actuator, said system comprising:

(a) a fluid pump;

(b) a fluid pressure regulating valve for regulating the the fluid pressure from said fluid pump in response to the position of an external actuator, said valve comprising:

(I) a body having

A. a first chamber,

B. a second chamber,

C. a passageway providing communication between said first and second chambers,

D. an inlet port communicating with said second chamber and with said fluid pump,

E. an outlet port communicating with said second chamber, and

F. a return port communicating with said second chamber;

(II) a valve element positioned within said second chamber for regulating communication between said second chamber and said inlet port;

(III) a first piston positioned within said first chamber for controlling the operation of said valve element;

(IV) a second piston positioned within said first chamber for controlling the operation of said first piston;

(V) a first spring positioned within said first chamber for urging said first piston in a direction to cause said valve element to close said inlet port; and

(VI) a second spring positioned between said first and second pistons to urge said pistons in opposite directions,

whereby a force applied to said second piston increases the second spring compressive force tending to urge said first piston in a direction to cause said valve element to open said inlet port, against the action of said first spring, for introducing a pressurized fluid into said second chamber, whereupon such fluid pressure acts via said body passageway against said first piston to urge said first piston in a direction to close said inlet port, against the action of said second spring;

(c) a cam-actuated valve lifter for transmitting a cylinder valve opening force from the engine cam, such force being variable in response to the magnitude of fluid pressure from said fluid pressure regulating valve; and

(d) a cylinder valve opening control device for transmitting the opening force from said cam-actuated valve lifter to the cylinder valve, said device comprising:

(I) a shaft; and

(II) a cam-like member, rotating about said shaft and having

A. an outer surface concentric with said shaft along a first section thereof, and

B. a second section thereof extending from said outer concentric surface and defining:

(i) a first cam-like surface formed integrally with said outer concentric surface and extending tangentially therefrom, and

(ii) a second engaging surface,

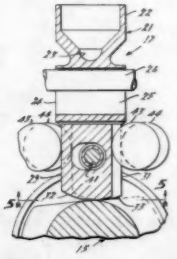
whereby a higher fluid pressure from said fluid pressure regulating valve to said valve lifter causes said lifter to transmit an opening force to said cylinder valve opening control device, the amount of rotation of said device being proportional to said fluid pressure, and whereby the amount the cylinder valve is opened is progressively proportional to the amount of rotation of said cylinder valve opening control device.

4,387,674

VALVE TRAIN

Calvin C. Connell, 1618 Twelve Oaks Way, North Palm Beach, Fla. 33408

Filed May 28, 1981, Ser. No. 267,745
Int. Cl.³ F01L *1/14, 1/24*
U.S. Cl. 123—90.16 **4 Claims**



1. In an internal combustion engine comprising a poppet valve supported for movement between an opened position and a closed position, an output shaft and valve actuating means including a cam and follower for controlling the opening and closing movement of said poppet valve in response to changes in the angular position of said output shaft, the improvement comprising means for varying the duration of the opening of said poppet valve in relation to output shaft rotation during the running of the engine comprising a member carried by said follower and movable therewith along a fixed path of

movement as said follower moves to open and close said valve, and means for adjusting said member relative to said follower to adjust said valve duration without altering the path of movement of said member upon the opening and closing of said valve.

4,387,675

ENGINE VALVE ACTUATING MECHANISM HAVING A HYDRAULIC FULCRUM LIFTING DEVICE

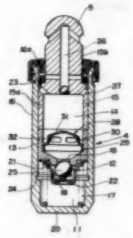
Takanobu Hori, Toyota; Fuminao Arai, Kariya; Hisashi Kodama, Nagoya, and Yoshio Okabe, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 23, 1981, Ser. No. 227,919

Claims priority, application Japan, Jan. 28, 1980, 55-8608; Mar. 1, 1980, 55-25637

Int. Cl.³ F01L 1/24

U.S. Cl. 123—90.58 1 Claim



1. A hydraulic fulcrum lifting device for a valve actuating mechanism of an internal combustion engine, said device comprising:

a hollow housing having a bottom wall and an open top end;

a plunger disposed in said housing for reciprocating movement, said plunger having an outer end extending outwardly through the open end of the housing and providing a fulcrum for a rocker arm of the valve actuating mechanism, said plunger being subjected to an outward biasing force of a spring;

a pressure chamber in the housing defined between said bottom wall and an inner end of the plunger;

a reservoir chamber in said plunger communicated with said pressure chamber through port means in said inner end of the plunger;

check valve means provided in said port means and adapted to open only toward said pressure chamber;

passage means formed in said plunger for opening the reservoir chamber to the atmosphere;

an annular stop member disposed proximate the open end of said housing and adapted to engage a shoulder portion of said plunger so as to limit the outward stroke of said plunger and to close said passage means when the device is not installed in the engine; and

deflector means provided in said reservoir chamber to encircle said port means and adapted to be fitted to the inside wall surface of said reservoir, said deflector means including a stop wall spaced from said port means, an annular side wall substantially parallel to and spaced from the inside wall surface of said reservoir, and opening means in said annular side wall permitting fluid communication between said reservoir and said port means.

4,387,676

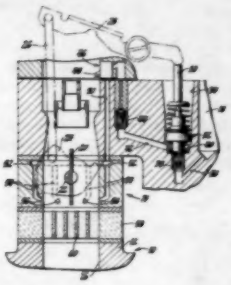
COLD STARTING SYSTEM FOR ALCOHOL FUELED ENGINE

Nuno P. Conceiro, Indianopolis, Brazil, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 4, 1980, Ser. No. 184,047

Int. Cl.³ F02M 1/08

U.S. Cl. 123—179 H 2 Claims



1. A cold starting system for an engine having an induction passage for air flow to the engine and a throttle in said induction passage for controlling flow therethrough, said system comprising an accelerator pump connected to said throttle and having upper and lower discharge nozzles for delivering a measured amount of liquid ethanol to said induction passage as said throttle is opened, said upper nozzle delivering liquid ethanol into said induction passage upstream of said throttle and said lower nozzle delivering liquid ethanol into said induction passage downstream of said throttle, a body defining a grid having a plurality of surfaces disposed in said induction passage downstream of said throttle at a location for intercepting substantially all liquid ethanol delivered from said lower nozzle before such liquid ethanol can impinge upon other surfaces in said induction passage, said grid being connected in an electric circuit and formed of a positive temperature coefficient thermistor material which limits current through said grid to maintain said grid at a substantially constant temperature suitable for evaporating liquid ethanol without unduly heating said air flow, a valve controlling flow through said lower nozzle, and means effective at temperatures below a selected value to cause said valve to permit flow through said lower nozzle and to energize said grid to evaporate the liquid ethanol delivered through said lower nozzle, thereby providing sufficient ethanol vapor to start the engine, said means being further effective when the engine is running to cause said valve to inhibit delivery through said lower nozzle and to deenergize said grid.

4,387,677

FUEL, MORE ESPECIALLY AUXILIARY STARTING FUEL, INJECTORS FOR INTERNAL COMBUSTION ENGINES AND TO AUXILIARY CARBURETORS ASSOCIABLE WITH SUCH INJECTORS

Jean Guerrier, Nesles la Vallee, France, assignor to Holt Lloyd S.A., Paris, France

Filed Jun. 23, 1981, Ser. No. 276,460

Claims priority, application France, Jun. 24, 1980, 80 14039

Int. Cl.³ F02N 17/00

U.S. Cl. 123—179 L 5 Claims

1. An auxiliary starting carburetor for internal combustion engines, arranged so as to deliver to the engine, through at least one injector, an auxiliary fuel from a reservoir containing said fuel in liquid form and under pressure, the reservoir being removable and having an expulsion port with a back-pressure valve normally maintained in the closed position, said auxiliary carburetor being arranged so that said reservoir is situated at its

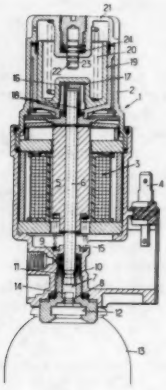
lower part, an electromagnetic coil being provided for controlling the opening or the shutting of said valve of said expulsion part, characterized in that it comprises the combination of following component parts arranged, respectively from bottom to top of the auxiliary carburetor disposed in its operating position:

a lower chamber in communication with the expulsion port of the reservoir,

an outlet port communicating with the lower chamber,

closure means adapted to selectively close off said outlet port under the action of control means,

a mobile pipe whose lower end opens into the lower chamber and is arranged to form said means for controlling the closure means, said pipe being arranged to occupy at least two operational positions, namely a first position which is a rest position, in which its lower end does not cooperate with the back-pressure valve of the reservoir and a second position in which it acts on said back-pressure valve so as to open the port of the reservoir,



a port for the intake of fuel carried by the lower end of the pipe and arranged to cooperate with the port of the reservoir when the pipe occupies its second operational position,

said electromagnetic coil for controlling the movement of the pipe from its first to its second operational position, said coil having a core integral with the pipe which passes therethrough,

first return means for returning the pipe from its second to its first operational position when the electromagnetic coil is not energized,

a closed enclosure,

a piston movable inside said enclosure for defining therein an upper variable volume chamber, in which the upper end of the pipe emerges,

and second return means acting on the piston so that the variable volume of the upper chamber is at a minimum when the carburetor is not operating,

the whole of the above-mentioned component parts, with the exception of the outlet port of the auxiliary carburetor, being coaxially disposed.

4,387,678

LIGHT METAL CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINES

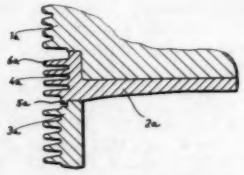
Paul Tholen, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Sep. 15, 1980, Ser. No. 187,519

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1979, 2937788

Int. Cl.³ F02F *1/26*

U.S. Cl. 123—193 H **3 Claims**



1. A light metal cylinder head arrangement for internal combustion engines, comprising in combination:

a cylinder head having a bottom portion directed toward an associated combustion chamber; and defining an axially extending, radially inwardly recessed, circular shoulder;

a cylinder barrel;

an annular insert of a ferrous metal interposed as well as geometrically adapted in a location directly between said cylinder head and said cylinder barrel said annular insert having an axially extending radial surface in direct engagement with the circular shoulder; and

a ferrous metal metal plate arranged on said cylinder head bottom, said annular insert adjoining the outer periphery of said metal plate; whereby without any fastening function of said metal plate and said annular insert and as a result of different heat stresses arising during combustion operation, forces are created which cause said metal plate to expand freely and to engage said cylinder head bottom as the metal plate distorts, due to combustion heat effecting deformation especially in a middle region thereof, easily toward said cylinder head so that said metal plate with increasing combustion-heat-caused expansion of the cylinder head due to combustion heat is pressed more strongly against said cylinder head bottom to assure sealing against leakage between said cylinder head and said cylinder barrel.

4,387,679

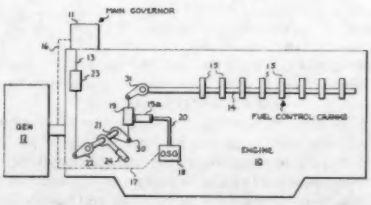
OVERSPEED PROTECTIVE SYSTEM FOR INTERNAL COMBUSTION ENGINES

Philip M. Folger, and Bobby L. Johnson, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Sep. 5, 1980, Ser. No. 184,494

Int. Cl.³ F02D *1/04*; F02B *77/08*

U.S. Cl. 123—198 D **8 Claims**



1. In an overspeed protective system for an internal combustion engine having a movable fuel control shaft, a speed re-

sponsive governor, a movable governor layshaft coupled to said governor for actuation thereby, throttle means for selecting the setting of said governor thereby to maintain a desired constant speed within a normal range of speeds, manually operable means connected to actuate said layshaft independently of said throttle means, a connecting link of variable length coupling said layshaft to actuate said fuel control shaft, said link having a predetermined normal length and being abruptly changeable to a different length which forces said fuel control shaft to move in a fuel reducing direction independently of the position of said layshaft, and means responsive to engine overspeed above the maximum of said normal speed range for causing said link to change its length, whereby engine speed is reduced upon actuation of said link independently of said governor and of said manually operable means.

4,387,680

MECHANISM FOR STOPPING VALVE OPERATION

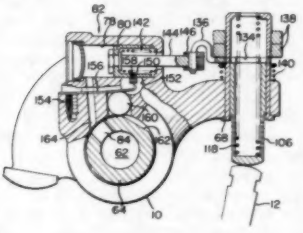
Katashi Tsunetomi; Akira Takahashi, and Katsuyuki Tsuji, all of Kyoto, Japan

Filed Apr. 21, 1981, Ser. No. 256,024

Claims priority, application Japan, Apr. 23, 1980, 55-52837; Nov. 11, 1980, 55-160741; Nov. 14, 1980, 55-159402

Int. Cl.³ F02D *13/06*

U.S. Cl. 123—198 F **12 Claims**



1. A mechanism for stopping operation of a valve comprising a plunger slidably mounted in a portion of a valve actuating system for actuating the valve used as an intake valve, an exhaust valve or the like of an internal combustion engine, a stopper engageable and disengageable with said plunger, an actuator for actuating said stopper, said stopper being engaged with said plunger to prevent sliding motion of the plunger thereby operating said valve, said stopper being disengaged from said stopper to allow sliding motion of the plunger thereby stopping the operation of said valve, and controlling means detecting phases of a valve actuating cam for actuating said valve to set commencement of operation of said actuator at the time just after a cam lift by said valve actuating cam ends.

4,387,681

FUEL SUPPLY CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Kenji Ikeura, and Tatsuo Morita, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 30, 1981, Ser. No. 230,289

Claims priority, application Japan, Jan. 31, 1980, 55-10499

Int. Cl.³ F02D *33/00*

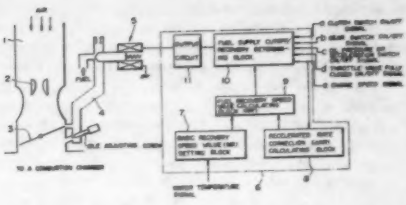
U.S. Cl. 123—325 **26 Claims**

1. A fuel supply control system for an internal combustion engine for driving an automotive vehicle, a fuel supply to the engine being cut off when the engine speed decreases from above a first predetermined value NRJ, the fuel supply being resumed when the engine speed, after being decreased from the first predetermined value NRJ is less than a second predetermined value NR, the fuel supply system comprising:

(a) first detecting means for signalling that the engine is decelerated and is under noload condition;

(b) second detecting means, responsive to the first detecting means signalling that the engine is not decelerated and is under noload condition, for signalling that a brake pedal of the vehicle is abruptly actuated; and

(c) means for calculating the second predetermined speed value NR and correcting the calculated second predetermined speed value so as to lower the second predetermined speed value NR when said second detecting means signals that the brake pedal is not actuated abruptly as compared with the speed value calculated either in the case when said second detecting means signals that the brake pedal is actuated abruptly or in the case when said first detecting means signals that the engine is decelerated under no-load condition within a region where engine stalling does not occur.



4,387,682

METHOD AND APPARATUS FOR CONTROLLING THE AIR INTAKE OF AN INTERNAL COMBUSTION ENGINE

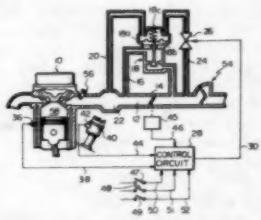
Hideo Miyagi, Okazaki, and Masaomi Nagase, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kaboshiki Kaisha, Toyota, Japan

Filed Sep. 23, 1981, Ser. No. 304,872

Claims priority, application Japan, Sep. 26, 1980, 55-133010

Int. Cl.³ F02D *9/00*

U.S. Cl. 123—339 **14 Claims**



1. A method of controlling the air intake of an internal combustion engine having an intake passage, a throttle valve disposed in the intake passage, and an air bypass passage which communicates the intake passage at a position located upstream of the throttle valve with the intake passage at a position located downstream of the throttle valve, said method comprising the steps of:

detecting the actual rotational speed of the engine to produce a rotational speed signal which represents the detected rotational speed;

detecting at least one of the operating conditions and the load condition of the engine to produce at least one engine condition signal which represents at least one of the detected operating condition and the detected load condition;

determining, in response to said at least one engine condition signal, a reference rotational speed which corresponds to

a desired rotational speed for at least one of the detected operating condition and the detected load condition;

calculating, by using the detected rotational speed signal and a signal indicative of the determined reference rotational speed, the difference between the actual rotational speed of the engine and the reference rotational speed to produce a control output signal which is determined by the calculated difference;

detecting whether the engine is in the starting condition to produce a starting condition signal;

increasing, in response to the starting condition signal, when the engine is in the starting condition, the reference rotational speed from said determined reference rotational speed by an incremental value;

calculating, in response to the starting condition signal, when the engine is in the starting condition, by using the detected rotational speed signal and a signal indicative of the increased reference rotational speed, the difference between the actual rotational speed of the engine and the increased reference rotational speed to produce a control output signal which is determined by the calculated difference; and

adjusting, in response to the control output signal, the sectional area of the air bypass passge to control the flow rate of air passing through the air bypass passage so as to reduce the difference between the actual rotational speed and the reference rotational speed.

8. An apparatus for controlling the air intake of an internal combustion engine having an intake passage, a throttle valve disposed in the intake passage, and an air bypass passage which communicates the intake passage at a position located upstream of the throttle valve with the intake passage at a position located downstream of the throttle valve, said apparatus comprising:

means for detecting the actual rotational speed of the engine to produce a rotational speed signal which represents the detected rotational speed;

means for detecting at least one of the operating condition and the load condition of the engine to produce at least one engine condition signal which represents at least one of the detected operating condition and the detected load condition;

means for determining, in response to said at least one engine condition signal, a reference rotational speed which corresponds to a desired rotational speed for at least one of the detected operating condition and the detected load condition;

means for calculating, by using the detected rotational speed signal and a signal indicative of the determined reference rotational speed, the difference between the actual rotational speed of the engine and the reference rotational speed to produce a control output signal which is determined by the calculated difference;

means for detecting whether the engine is in the starting condition to produce a starting condition signal;

means for increasing, in response to the starting condition signal, when the engine is in the starting condition, the reference rotational speed from said determined reference rotational speed by an incremental value;

said means for calculating, in response to the starting condition signal, when the engine is in the starting condition, by using the detected rotational speed signal and a signal indicative of the increased reference rotational speed, calculating the difference betwen the actual rotational speed of the engine and the increased reference rotational speed to produce a control output signal which is determined by the calculated difference, and

means for adjusting, in response to the control output signal, the sectional area of the air bypass passage to control the flow rate of air passing through the air bypass passage so as to reduce the difference between the actual rotational speed and the reference rotational speed.

4,387,683

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

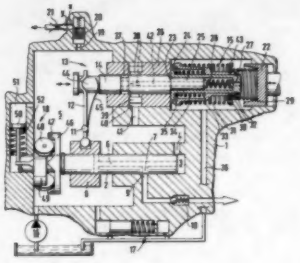
Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 22, 1980, Ser. No. 123,608

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909558

Int. Cl.³ F02D 1/06

U.S. Cl. 123—387 **6 Claims**



1. A fuel injection pump for internal combustion engines having a pump housing a cam drive to effect rotational and reciprocal movement for the supply movement of at least a pump piston, said pump including a portion supported in said pump housing which is adjustable relative to its rotating portion counter to a restoring force for the purpose of adjusting the onset of injection by means of a displaceable adjusting piston in a working cyiinder, said working cylinder being at least indirectly connected to receive fuel from a fuel supply pump, the supply pressure of said fuel supply pump being controllable in proportion to the rpm by means of a pressure control valve and said supply pressure being further controllable by means of the supplementary discharge of a partial quantity of fuel through a discharge channel including an overflow valve, characterized in that said injection pump is controlled by means of a hydraulic rpm governor, said rpm governor including a governor piston extending into said pump housing having opposite end portions one of which is exposed to the supply pressure of said fuel supply pump and adjustable counter to the force of governor springs within said pump housing, a bushing surrounding a portion of said governor piston and fixed in a bore in said pump housing, one end of said governor piston extending into a pressure-relieved chamber which encompasses said governor springs, and further that said governor piston at least controls a relief channel in said housing, said bushing and said governor piston which indirectly effects pressure in said working cylinder of said adjusting piston, said relief channel including mouth portions in said bushing and said governor piston arranged to overlap one another to a greater or lesser extent during movement of said governor piston for controlling the cross section of said mouth portions in said bushing in said pump housing for controlling discharge of fuel from said injection pump.

4,387,684

IGNITION ADVANCE CIRCUIT WITH SENSOR INPUTS

Rupin J. Javeri, Elk Grove, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Oct. 13, 1981, Ser. No. 310,004

Int. Cl.³ F02P 5/04

U.S. Cl. 123—416 **12 Claims**

1. An ignition advance control circuit as for a spark ignition engine having a crankshaft and comprising:

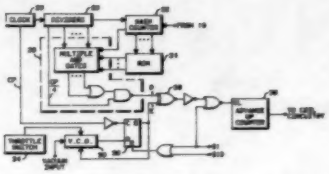
first input means for supplying a first input signal in response to crankshaft rotation;

counter means coupled to the first input means and having an

output count which is inversely proportional to crankshaft velocity;

first pulse providing means coupled to the counter means output for providing a first output signal wherein the number of pulses per crankshaft rotation is a predetermined function of said output count;

second input means for providing a second input signal whose amplitude is a function of an engine characteristic other than velocity;



second pulse providing means coupled to the second input means for providing a second output signal whose frequency is a function of the amplitude of the second input signal;

adder means coupled to the first and second pulse providing means for providing a third output signal which is substantially the sum of the first and second output signal pulse rates; and

means coupled to the adder means for controlling spark timing in an engine in response to the adder means output signal under at least some engine conditions.

4,387,685

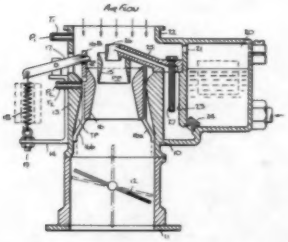
FLUIDIC CONTROL SYSTEM INCLUDING VARIABLE VENTURI

Harold G. Abbey, 11 Goldsmith Dr., Holmdel, N.J. 07733

Continuation-in-part of Ser. No. 214,626, Dec. 10, 1980, Pat. No. 4,308,835. This application Oct. 2, 1981, Ser. No. 307,956

Int. Cl.³ F02M *9/14*

U.S. Cl. 123—439 **15 Claims**



1. A variable structure which provides throughout an extended range the characteristics of a Venturi whose differential velocity-pressure output is proportional to the mass-volume of a fluid stream passing therethrough, said structure comprising:

A. a tubular casing into which the fluid stream is admitted;

B. a cylindrical spool supported within the casing for free axial movement therein, said spool having an interior flow passage, said spool defining an exterior flow passage in the annular space between the spool and the casing which exterior passage is always open in the course of said movement whereby the stream admitted into the casing is divided and flows through the interior and exterior passages, said spool having a Venturi-contoured surface lying in at least one of said passages, causing said stream to exert a hydrodynamic force on the spool which acts to displace the spool axially in the downstream direction; and

C. means imposing a countervailing force on the spool whereby the extent of spool displacement is the resultant of the hydrodynamic and countervailing forces, said displacement providing a differential velocity-pressure output proportional to the mass volume of the admitted fluid stream throughout an extended range.

4,387,686

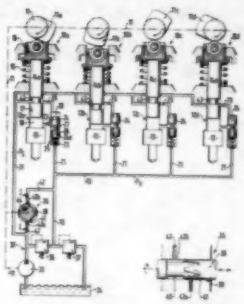
FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES, IN PARTICULAR FOR DIESEL ENGINES

Jean Leblanc, Lyons; Jean Pigeroulet, Villeurbanne, both of France; Max Straubel, and Konrad Eckert, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 27, 1981, Ser. No. 223,954

Int. Cl.³ F02M *41/02*

U.S. Cl. 123—446 **18 Claims**



1. A fuel injection apparatus for internal combustion engines, in particular for Diesel engines, having per engine cylinder one mechanically driven pump piston of an injection pump and a pump work chamber in said injection pump supplied with fuel under supply pressure by a supply pump and preferably combined with an injection nozzle into a pump/nozzle unit, each apparatus having one control slide, said slide being limited by a pressure chamber and actuatable by the control pressure of a source of control fuel which is common to all the injection pumps counter to the force of at least one restoring spring, said control slide further being inserted into a discharge channel in permanent communication with said pump work chamber and arranged to close this discharge channel at will in order to initiate the variable onset of injection and further arranged to open said channel again in order to terminate the injection, said apparatus further including a control apparatus whereby pressure can be exerted via control lines upon said pressure chambers of said control slides, characterized by the following characteristics:

(a) said control fuel source is embodied by said supply pump dimensioned by a control pressure (p_S) increased severalfold over the supply pressure (p_V) of said injection pumps and by a first pressure limitation valve limiting the control pressure (p_S) in a control pressure line capable of being connected with said control lines;

(b) said first pressure limitation valve being correlated with a second pressure limitation valve, said second pressure limitation valve arranged to determine the supply pressure (P_V) prevailing in filling lines separate from said control lines;

(c) said control apparatus comprises a valve assembly common to all of said injection pumps said assembly arranged to determine the onset and duration of pressure upon said pressure chambers of said control slide, and a distributor means separate from said valve assembly arranged to communicate with said control lines leading to said pressure chambers of said control slides said means arranged to be connected at a predetermined time to said control pressure line in synchronism with said injections and further wherein;

(d) said control pressure (p_S) required for actuation of said control slides and exerted via said distributor means upon one of said pressure chambers at a time established by means of said valve assembly which blocks the discharge of control fuel out of said control pressure line into a low-pressure line and is subsequently relieved toward said low-pressure line for the purpose of effecting the return stroke of said control slide.

(e) said filling lines are connected to a supply line which is under supply pressure (p_V) and which is common to all of said injection pumps; and

(f) said pump work chamber can be made to communicate with said filling line by means of an overflow channel controlled by a control location provided on said control slide.

4,387,687

CONTROL APPARATUS FOR A FUEL METERING SYSTEM IN AN INTERNAL COMBUSTION ENGINE

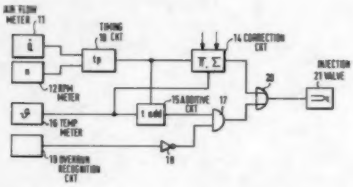
Rainer Höppel, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 21, 1980, Ser. No. 209,346

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1979, 2948867

Int. Cl.³ F02B *3/02*; F02D *5/00*

U.S. Cl. 123—493 **5 Claims**



1. In a control apparatus for a fuel management system of an internal combustion engine having pulse operated fuel control means, pulse generating means for generating pulses for operating the fuel control means, and first correction circuit means connected to the pulse generating means for lengthening the pulses, during engine warm-up, the improvement comprising:

second correction circuit means connected to the pulse generating means for lengthening the pulses to a greater extent than said first correction circuit means, during engine warm-up;

means for detecting an engine overrunning condition; and a third circuit means in response thereto for applying only the pulses from the first correction circuit means to the fuel control means during the engine overrunning condition.

4,387,688

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 124,886, Feb. 26, 1980, abandoned. This application Aug. 18, 1982, Ser. No. 409,248

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909559

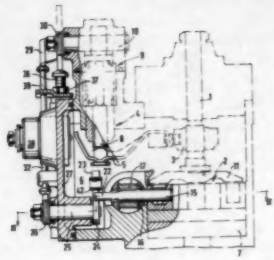
Int. Cl.³ F02D *1/06*

U.S. Cl. 123—502 **11 Claims**

1. A fuel injection pump for internal combustion engines comprising

(A) a housing, a cam drive in said housing which effects the supply movement of at least one pump piston, said cam drive having a housed rest portion and a revolvable portion, said rest portion being adjustable relative to said revolvable portion to adjust the onset of injection via means responsive at least in accordance with rpm, said means having a stop, and an intervention lever means disposed exteriorly of said housing adapted to cooperate with said stop;

(B) a fuel control member, an rpm governor operating to control said fuel control member which determines injection quantity, an arbitrarily actuatable adjusting lever which varies the rpm of said governor, with an outset position of said governor being determined by means of an adjustable idling stop; and



(C) a coupling means between said intervention lever and said adjusting lever;

characterized in that said coupling means includes a displaceable rod supported exteriorly of said housing and a spring surrounding said rod which reacts relative to said rod to force said rod in constant contact with said intervention lever, said spring cooperating with an end of said rod remote from said intervention lever to act as an idling stop for said adjusting lever.

4,387,689

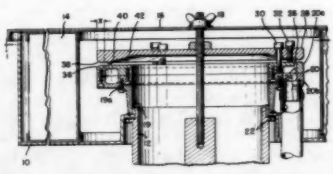
APPARATUS FOR CONVERTING A CARBURETOR FOR GASEOUS FUEL

William J. Brown, Whatcom County, Wash., assignor to Bureau of Faculty Research of Western Washington University, Bellingham, Wash.

Filed May 15, 1981, Ser. No. 263,922

Int. Cl.³ F02M *21/04*

U.S. Cl. 123—525 **11 Claims**



1. A gaseous and liquid-fuel carburetor for an internal-combustion engine having a liquid-fuel carburetor with an inlet flange, an air cleaner housing, and an air cleaner, comprising:

an adapter member for coupling to said carburetor inlet flange, and

mixing means within said air cleaner housing coupled to said adapter member, said mixing means including an air inlet venturi nozzle for guiding air into said inlet flange, and means within said venturi nozzle for introducing gaseous fuel into the venturi for mixing with air, said air inlet venturi including a pair of upper and lower spaced plates defining a substantially continuous, circumferential venturi passage, said passage converging from an outer large entrance opening defined by smooth curved opposed corners on said plates to an intermediate narrow neck portion defined by elongated substantially parallel opposed surfaces on said plates, said surfaces downstream of said narrow neck portion smoothly diverging for a sub-

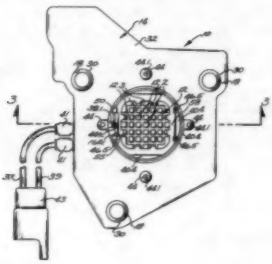
stantial length to an inner larger discharge opening, said means for introducing gaseous fuel being located at the closest spacing between said substantially parallel surfaces in said intermediate narrow neck opening, and downstream of said corners sufficient to be in substantially laminar flow, and wherein said smoothly curved corners, said substantially parallel surfaces of said narrow neck portion with the means for introducing the gaseous fuel located therein, and said smooth divergence to the discharge opening being capable of providing a low air pressure at the gaseous fuel introduction location but only a small total pressure drop across the entire venturi thereby maximizing fuel input and air input to the carburetor.

4,387,690

FUEL EVAPORATION DEVICE

Donald J. Chiavaroli, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 12, 1981, Ser. No. 320,274
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—549 **8 Claims**



1. A fuel evaporation device for use in a fuel supply system having an air-fuel passage for directing an air-fuel mixture into an intake manifold of an engine where fuel condensation may occur on the walls of the passage, said device comprising a self regulating electrical resistance heater to be suspended in the intake manifold to enhance fuel evaporation without interfering excessively with the flow of the air-fuel mixture into the manifold and tube means arranged to intercept fuel condensed on the walls of the air-fuel passage and to extend into the manifold to direct such condensed fuel onto the heater, characterized in that electrically insulating gasket means are adapted to be mounted on the engine for locating the device to receive an air-fuel mixture from the passage, a pair of terminal means are mounted in electrically insulated relation to each other on the gasket means, the tube means are electrically connected at one end to one of the terminal means and at an opposite end to the heater to dispose the heater within the manifold in the path of the air-fuel mixture directed into the manifold, and conductor means connect the heater to the other of said terminal means for electrically connecting the heater in an energizing circuit.

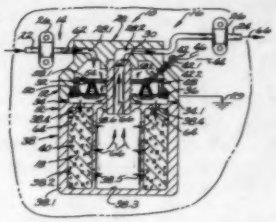
4,387,691

DIESEL FUEL FILTER SYSTEM

Leo Marcoux, Rehoboth, Mass., and Youn Ting, Lexington, Ky., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 7, 1980, Ser. No. 204,965
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **13 Claims**

1. A fuel filter system for a diesel engine having a housing means with inlet and outlet means, having filter means detachably mounted on the housing means to pass diesel fuel therethrough to remove extraneous material from the fuel as the fuel passes to the engine, and having electrical resistance heater means for heating the fuel to deter clogging of the filter means by components of the fuel which tend to solidify at relatively lower temperatures, characterized in that said outlet means includes a centrally disposed outlet port open at one end for receiving fuel from the filter means and said inlet means includes an inlet port which opens at one end in surrounding relation to said outlet port for furnishing fuel to the filter means, the filter means comprises a can open at one end having a central chamber connected to said outlet port and having a filter media arranged inside the can around the central chamber so that an edge of the filter media is aligned with said open end of the inlet port surrounding said outlet port to receive fuel directly from the inlet port, and a plurality of self-regulating electrical resistance heater elements of positive temperature coefficient of resistivity are disposed in said inlet port spaced around the central outlet port immediately adjacent to the filter media in the filter means to facilitate increase in temperature of fuel at the moment it passes into the filter media of the filter means.

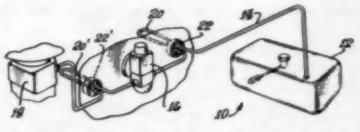


4,387,692

PETROLEUM PREHEATING DEVICE FOR ENGINES

Douglas H. Blackschleger, 304 W. Allen Ave., San Dimas, Calif. 91773

Filed Jan. 19, 1981, Ser. No. 226,234
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **2 Claims**

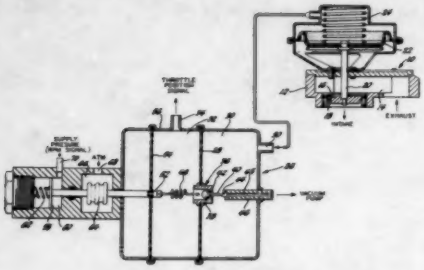


1. In an internal combustion engine system having, inter alia, an engine block containing a coolant cavity which surrounds the cylinder walls of such an engine system, and which engine block contains a plurality of openings through the block walls or base into the said coolant cavity, each of said openings being normally sealed by freeze plugs forced fit and welded or braised in place, the improvement of the introduction, in series, of a plurality of generally elongated U-shaped extensions into the fuel line between the fuel reservoir and the carburetor of such an engine system, such that each such U-shaped extension is situated so as to pass into the coolant cavity of the engine block and returning therefrom through specially adapted freeze plugs, each such U-shaped extension utilizing a different one of the freeze plug openings as its access to said coolant cavity, and each such U-shaped extension being welded or braised into the central portion of such specially adapted freeze plugs to provide sealing for the coolant cavity when installed.

4,387,693
EXHAUST GAS RECIRCULATION CONTROL

Edward R. Romblom, DeWitt, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 18, 1981, Ser. No. 322,527
Int. Cl.³ F02M 25/06
U.S. Cl. 123—569 4 Claims

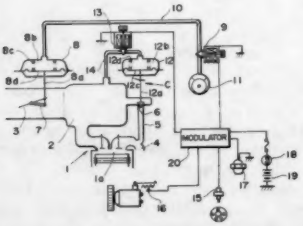


1. An exhaust gas recirculation control assembly for a diesel engine having a throttle member controlling fuel flow to the engine, means for generating a pressure which varies with the position of said throttle member, means for generating a pressure which varies with engine speed, and a diaphragm operated valve controlling recirculation of exhaust gases in response to variations in a control pressure, said assembly comprising a diaphragm assembly including a first diaphragm portion sensing said control pressure and a second diaphragm portion sensing said throttle position related pressure, a valve mechanism connected to said diaphragm assembly for varying said control pressure in proportion to said throttle position related pressure, a spring biasing said valve mechanism to maintain said control pressure offset from said throttle position related pressure, and a pressure responsive member connected to said spring and responsive to said speed related pressure for increasing the bias to thereby increase the offset of said control pressure as engine speed increases.

4,387,694
EGR CONTROL SYSTEM FOR DIESEL ENGINE

Yasutaka Yoshiba, Chiba, and Masaji Shiobara, Chigasaki, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 11, 1981, Ser. No. 262,788
Claims priority, application Japan, May 12, 1980, 55-61676
Int. Cl.³ F02M 25/06
U.S. Cl. 123—571 12 Claims



1. An EGR control system for a diesel engine having an intake passageway and an exhaust passageway, comprising:

means defining an EGR passageway interconnecting the intake and exhaust passageways to recirculate engine exhaust gas therethrough back to the engine;

an EGR control valve operatively disposed in said EGR passageway to control the flow of the recirculated exhaust gas passing through said EGR passageway, said EGR control valve including a first diaphragm actuator having a diaphragm member which defines a vacuum operating chamber, and a valve head connected to said diaphragm member and disposed in the EGR passageway so that said EGR passageway is closable with said valve head in response to the movement of said diaphragm member;

a throttle valve pivotally disposed within the intake passageway;

means for detecting at least one of engine speed, engine load and engine coolant temperature to generate at least a signal dependent thereon, said detecting means including at least one of an engine speed sensor for sensing engine speed of the engine, an engine load sensor for sensing engine load of the engine, and an engine coolant temperature sensor for sensing the temperature of engine coolant of the engine, said sensors generating respective information signals representative of an engine operating condition;

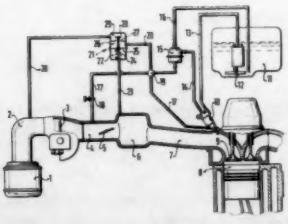
means for controlling the operation of said EGR control valve in response to the signal from said detecting means so as to control the amount of the recirculated exhaust gas in accordance with engine operating conditions, said EGR control valve operation controlling means including a modulator electrically connected to at least one of said engine speed sensor, said engine load sensor, and said engine coolant temperature sensor, said modulator being constructed and arranged to generate at least a command signal in response to at least one of said information signals supplied thereto, and a first electromagnetic valve electrically connected to said modulator to control vacuum supply to the vacuum operating chamber of said first diaphragm actuator in response to said command signal; and

means for controlling the operation of said throttle valve in response to the signals from said detecting means, said throttle valve operation controlling means including a second diaphragm actuator having a diaphragm member which defines a vacuum operating chamber, said throttle valve being connected to said diaphragm member, and a second electromagnetic valve electrically connected to said modulator to control vacuum supply to the vacuum operating chamber of said second diaphragm actuator in response to said command signal.

4,387,695
FUEL INJECTION APPARATUS

Rainer Höppel, Stuttgart, and Heinrich Knapp, Leonberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,125
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1980, 3033644
Int. Cl.³ F02B 3/00; F02M 23/04
U.S. Cl. 123—585 2 Claims



1. A fuel injection system for mixture-compressing internal combustion engines with externally supplied ignition, said system having an intake tube in which a flow rate meter and an

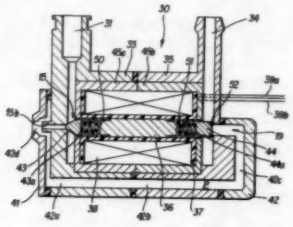
arbitrarily actuatable throttle device are disposed in sequence and the flow rate meter is moved counter to a restoring force in accordance with the quantity of air flowing therethrough further wherein said flow rate meter influences the quantity of the fuel to be injected at least through one injection valve into the intake tube, further wherein said system includes an air preparation line which branches off from said intake tube section between the flow rate meter and the throttle device and leads to the injection valve, said injection valve arranged to effect preparation of said fuel by means of the air delivered downstream of the valve seat of the injection valve, characterized in that said air preparation line includes a throttle restriction and further that a full-load air line is arranged to discharge into said air preparation line between said throttle restriction and said injection valve, further wherein said full-load air line branches off from said intake tube section upstream of said flow rate meter said last named line further including a blocking valve provided with a movable valve member which is controllable in accordance with the intake tube pressure downstream of said throttle device.

4,387,696

ELECTROMAGNETICALLY CONTROLLED FUEL INJECTION SYSTEM

Kenji Yogo, Nagoya, and Isshi Nomura, Aichi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 9, 1982, Ser. No. 356,404
Claims priority, application Japan, Mar. 9, 1981, 56-33526
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—585 **4 Claims**



1. An electromagnetically controlled fuel injection system, comprising:

means for sensing a plurality of operating conditions of a combustion engine and for generating a plurality of electric signals corresponding to said conditions;

an electrical control unit receiving said first electric signals to thereby generate a second electric signal in response thereto;

electromagnetically controlled fuel injection valve means controlled by said second signal from said electrical control unit and having a fuel injection port; and

electromagnetically controlled air supply valve means provided with an air supply port around said fuel injection port of said fuel injection valve means and controlled by said second signal from said electric control unit.

4,387,697

ARROW POINT PULLER AND BOW STABILIZER

J. Douglas Duke, 7010 Ficken Rd., Cedar Hill, Mo. 63016

Filed Nov. 28, 1980, Ser. No. 211,240
Int. Cl.³ B23P *19/04*
U.S. Cl. 124—89 **9 Claims**

1. An arrow point puller and stabilizer device for use in extracting arrow points embedded in objects comprising an elongated shaft member having spaced first and second opposite end portions, means attached to the first end portion of the shaft member forming an outwardly extending anvil portion adjacent thereto, means adjacent the second shaft end portion for attaching to an arrow point, and other means including a hammer member of relatively compact construction to form a weight releasably attached adjacent to said second shaft end portion in spaced opposed relation on the shaft member from the anvil portion, said hammer member having spaced opposed end surfaces and between the end surfaces a bore therethrough for slideably receiving the shaft member, the end surfaces of the hammer member being spaced apart substantially less than the first and second end portions of the shaft member, said hammer member having means thereon for detachably connecting the hammer member to the shaft member adjacent to the second end portion thereof, said hammer member being

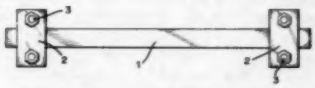
detachable from the second shaft end portion and thereafter being slideably positioned on the shaft member so that the hammer member can be slideably movable along the shaft member for engagement with the anvil surface whereby a portion of one of the opposed end surfaces of the hammer member can be controllably impacted against the anvil portion to apply force longitudinally of the shaft member and in a direction to extract the arrow point from its embedded position, said shaft member being substantially longer than the hammer member so that a substantial portion of the shaft member is exposed in all positions of the hammer member thereon.

4,387,698

SLURRY SAW BLADE HEAD ASSEMBLY

Samir T. Bustany, Morris Township, Morris County, N.J., assignor to Allied Corporation, Morris Township, N.J.

Continuation of Ser. No. 67,571, Aug. 17, 1979, abandoned. This application Mar. 20, 1981, Ser. No. 245,774
Int. Cl.³ B28D *1/06*
U.S. Cl. 125—18 **13 Claims**



1. A blade head assembly for a slurry saw for slicing hard bodies of crystalline material comprising a plurality of elongated thin blades in spaced parallel relationship characterized in that the blades are non-sharpened, have a thickness of from about 0.02 to 0.14 mm, and are of a metal which is at least about 50 percent amorphous.

4,387,699

SPACE HEATING STOVE

Charles J. Murch, Jr., Box 77, Franklin, Me. 04634

Filed May 6, 1981, Ser. No. 261,046
Int. Cl.³ F24C *1/14*
U.S. Cl. 126—61 **12 Claims**

1. A space heating stove, comprising:

a combustion chamber defined by a floor, a pair of opposed end walls projecting upwardly from said floor, and a pair of opposed side walls projecting upwardly from said floor and in cooperation with said end walls to enclose said chamber;

said floor, said end walls and said side walls formed by heat resistant and heat insulating ceramic material;

means in operative relationship with said floor and said walls for supporting said floor and said walls;

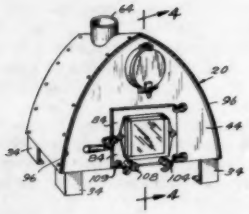
each of said end walls defining a first opening therein, and a perforated, heat and oxidation resistant, cylindrical member extending through said combustion chamber and positioned within said openings;

a front plate member projecting upwardly from said support means and in spaced apart relationship with respect to a front one of said end walls;

a rear plate member projecting upwardly from said support means and in spaced apart relationship with respect to a rear one of said end walls;

a front baffle member located adjacent to said front end wall between said front end wall and said front plate member and projecting beyond an upper edge of said front end wall along said upper edge to a predetermined location above said support means;

a rear baffle member located adjacent to said rear end wall between said rear end wall and said rear plate member and projecting beyond an upper edge of said rear end wall along said upper edge to a predetermined location above said support means;



first and second plate members positioned in contacting relationship with said front and rear plate members and with said front and rear baffle members and in spaced apart relationship from said side walls;

an exhaust port attached to said first and second plate members and in fluid communication with said combustion chamber;

a shroud attached to and in spaced apart relationship from said first, second and rear plate members;

said front end wall further defining a second opening for enabling loading of fuel into said combustion chamber, wherein said front plate member also defines an additional opening in substantial alignment with said second opening, and further including panel members connecting said second opening and said additional opening to form a passage for receiving fuel into said combustion chamber; and

a door hinged to said front plate member for closing said second opening and said passage.

4,387,700

WOODSTOVE HAVING EXHAUST FLOW COMPENSATION AND A METHOD FOR PROVIDING SAME

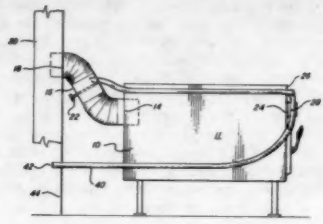
Merritt J. Eggleston, Sears Hill Rd., Richford, N.Y. 13835

Filed May 21, 1981, Ser. No. 265,852
Int. Cl.³ F24C 1/14
U.S. Cl. 126—77 **6 Claims**

1. Apparatus for compensatory control of air flow to a wood stove having a combustion chamber, at least one inlet port for admitting air from a main source therefor into said combustion chamber, an exit port for exhausting the byproducts of combustion therefrom, a chimney and an exhaust pipe coupling said exit port to said chimney, said apparatus comprising:

(a) conduit means for heating and conveying auxiliary air, positioned in contact with the stove, connected between a source of auxiliary air and said chimney, for exhausting heated auxiliary air into said chimney; and

(b) damper means, for controlling the flow of air into the stove and within said conduit means, having first and second ganged sections, mounted in movable relationship within said conduit means and to said inlet port, with said first section positioned to slide in front of said inlet port and said second section positioned to slide within said conduit means, said first and second sections each having an aperture portion and a blocking portion, said blocking portion of said first section being positioned in said



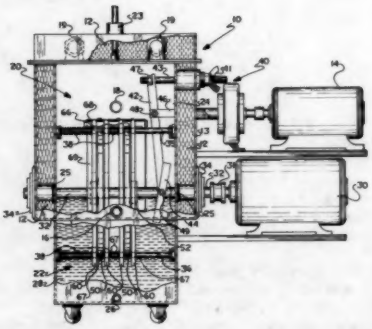
damper means to block said inlet port at the same time that said aperture portion of said second section permits the flow of auxiliary air within said conduit means and section blocking portion of said second section being positioned in said damper means to block the flow of air in said conduit means at the same time that said aperture portion of the first section permits the flow of air into said combustion chamber through said inlet port.

4,387,701

FLUID FRICTION FURNACE

Edwin E. Gibbons, R.D. #3, Beech St., Newton Falls, Ohio 44444

Filed Feb. 11, 1980, Ser. No. 120,365
Int. Cl.³ F24C 5/00
U.S. Cl. 126—247 **10 Claims**



1. An apparatus for the generation of heat, comprising:

(a) an enclosed container assembly having side walls;

(b) a rotatable shaft mounted through said side walls of said container assembly;

(c) an upper stationary shaft and a lower stationary shaft extending within said container assembly between two said side walls;

(d) a plurality of stationary plates having a recess about said rotatable shaft and slidably engaged to both said stationary shafts;

(e) a plurality of rotating discs having radial surfaces and interspaced in proximity to said stationary plates, each said rotating disc slidably engaged to and rotatable with said rotatable shaft and having a plurality of fluid induction grooves on said radial surfaces;

(f) pressure means for placing said stationary plates near to said rotating discs, both said stationary shafts having tension means for restraining said slidable engagement of said stationary plates on both said stationary shafts;

(g) a volume of heat transfer fluid in communication with the lower extremities of said stationary plates and said rotating discs and inducible into said fluid induction grooves of said rotating discs and from said grooves in frictional, pressured communication between said discs and said plates, and wherein each said disc is separated from adjacent said plates at a distance from about 0.001 to about 0.010 inch; and

(h) a deflection plate mounted on the outer perimeter of all said stationary plates.

6. A method for the production of heat, comprising:

(a) tensionally placing a plurality of rotating discs within 0.001 to about 0.010 inch to a plurality of stationary plates interspaced therewith, each said stationary plate having a deflection plate mounted on the outer perimeter thereof, each said rotating disc having radial surfaces and slidably secured to a rotating shaft rotatably secured to an enclosed container, and each said rotating disc having a plurality of fluid induction grooves on said radial surfaces;

(b) rotating said shaft and all said rotating discs, the lower extremities of said rotating discs in a pool of heat transfer fluid in said enclosed container;

(c) inducing said heat transfer fluid into said fluid induction grooves in said rotating discs tensionally proximal with said stationary plates;

(d) forcing said fluid from between said rotating discs and said stationary plates along said radial surfaces in a pressured, frictional manner during said rotation of said rotating discs; and

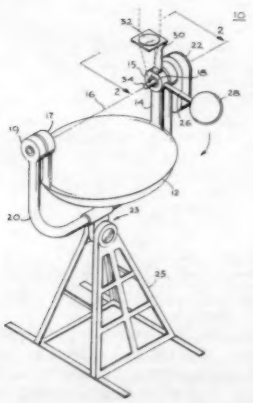
(e) transferring the heat from said heat transfer fluid to said container.

4,387,702

SOLAR TRACKING SYSTEM

Jack P. Murphy, deceased, late of Huntington Beach, Calif. (by James P. Murphy, administrator), and Steven D. Kimmell, Granada Hills, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Mar. 16, 1981, Ser. No. 244,515
Int. Cl.³ F24J 3/02
U.S. Cl. 126—424 **5 Claims**



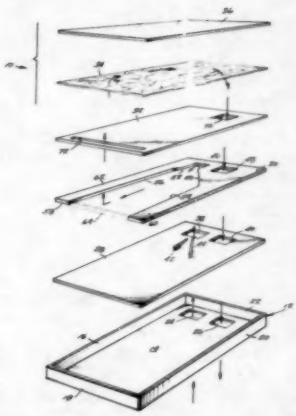
1. A tracking device comprising a fixed support; means for directing the sun's rays movably attached to the fixed support; means for applying a force to tend to move the means for directing the sun's rays; and means responsive to heat produced by the sun's rays for braking and releasing the means for directing the sun's rays, including a heat conductive bar coupled to the means for directing the sun's rays, a heat sensitive coil wrapped tightly around and in thermal contact with the bar and fixed to preclude movement of the bar in the normal ambient temperature range of operation of the tracking device, the coil being adapted to permit movement of the bar when the coil is heated, and means for applying heat to the coil.

4,387,703

SOLAR HEATING DEVICE

Lee H. Poole, 34 North St., Washingtonville, N.Y. 10992

Filed May 13, 1981, Ser. No. 263,201
Int. Cl.³ F24J 3/02
U.S. Cl. 126—429 **3 Claims**



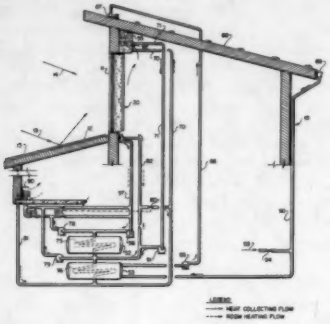
1. A solar collector for directly heating the air going to a building comprised of frame means including side and bottom walls for enclosing the collector along those wall areas, said bottom wall including means defining two spaced apart openings adjacent one end for allowing air to respectively enter and exit the collector, a first insulation layer engaging the interior of said bottom wall and provided with means defining two spaced apart openings in alignment with each of the openings in the bottom wall, a second insulation layer positioned on said first insulation layer having means defining two spaced apart openings at one end in alignment with each of the openings in said first insulation layer, one of said openings aligned with the entrance opening being enlarged to form a gradually enlarging area extending along the length and width of said second insulation layer so that the opening extends to and substantially across the width of the opposite end thereof, a third insulating layer covering said second insulating layer and having first means at one end defining an opening aligned with the exit opening and second means at the opposite end defining a slit type opening extending substantially across the width of said opposite end, a permeable adsorber layer positioned above said third insulation layer, a transparent cover layer extending across said collector and sealed to said side walls, and mounting means positioned about the exterior of the entrance and exit openings for connecting said collector directly to the atmosphere in the building, said mounting means including air circulation means for circulating air from the building through the collector and back to the building.

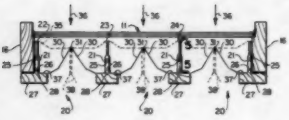
4,387,704

MULTI-MODE SOLAR HEAT RECOVERY DEVICE

Carl S. Minden, 314 Federal Heights Cir., Salt Lake City, Utah 84103

Filed Jul. 6, 1981, Ser. No. 280,777
Int. Cl.³ F24J 3/02
U.S. Cl. 126—435 21 Claims





1. A multi-mode solar heat recovery device for use at an interior surface of a window whose opening permits high transmittance of sunlight while otherwise providing an effective weather barrier, said device including a radiant heat collector, comprising:

a. at least one heat conductive plate adapted at one edge for fixation near said window, said plate being positioned such that its principal surface would be substantially perpendicular to said window, at least a portion of said surface being adapted with means to provide a high degree of heat absorbtion when exposed to sunlight;

b. at least one heat conductive tube in thermal contact with said plate, said tube being adapted with means for receiving a fluid therein for removing heat from said plate and with means for fluid conveyance to a point of heat utilization;

c. a light reflective surface having a variable orientation with respect to and an exposure toward the treated surface of said plate and including means at one edge thereof for pivotal mounting at an axis whose orientation is substantially parallel to and is displaced from said treated surface; and

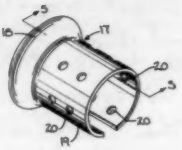
d. said light reflective surface, including means for adjustment (i) from a closed position wherein said device is adapted for placement of the reflective surface approximately parallel to said window opening, thereby shielding said treated surface from exposure to sunlight and reflecting substantially all transmitted light back through the window opening, (ii) through an intermediate position wherein the reflective surface is adapted for diagonal placement with respect to said window for reflection of the transmitted light toward the heat conductive plate, (iii) to a fully open position wherein the reflective surface is adapted for substantial perpendicular orientation to said window opening, providing for relatively unobstructed transmittance of said light.

4,387,705

PENILE IMPLANT

Roy P. Finney, Tampa, Fla., assignor to Medical Engineering Corporation, Racine, Wis.

Continuation-in-part of Ser. No. 169,174, Jul. 15, 1980. This application Dec. 9, 1981, Ser. No. 328,826
Int. Cl.³ A61B 19/00; A61F 5/00
U.S. Cl. 128—1 R 5 Claims



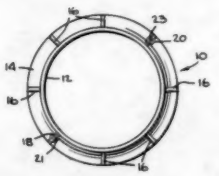
1. A penile implant comprising an implant of biocompatible material including a ring with a generally D-shaped cross section with the belly of the D extending outwardly and an anchoring sleeve connected to the ring, said ring and sleeve being shaped and sized to be positioned circumferentially about a penis and implanted beneath the penile skin to provide a circumferential outwardly extending protuberance which assists in retaining a urinary collection device upon said penis.

4,387,706

IRIS RETRACTOR

Robert M. Glass, 1173 Staffler Rd., Bridgewater, N.J. 08807

Filed Apr. 10, 1981, Ser. No. 252,951
Int. Cl.³ A61B 17/02
U.S. Cl. 128—20 6 Claims



1. An iris retractor for use during eye surgery, comprising:

a substantially circular, resilient ring, said ring having an arcuate flange co-extensive therewith extending outwardly therefrom;

a plurality of transverse, reinforcing struts extending from said ring across said arcuate flange; and

a pair of opposing pinions situated on the flange of the substantially circular, resilient ring and co-linear with the center of said ring, wherein said retractor, prior to being placed within the pupil, may be contracted into a substantially oval configuration by means of suitable forceps engaging said opposing pinions, and wherein said retractor, when placed within the pupil, may be expanded back into its circular configuration by means of the resiliency within said retractor.

4,387,707
EYE TREATMENT DEVICE AND METHOD

Lawrence A. Polikoff, 2831 Medill Pl., Los Angeles, Calif. 90064

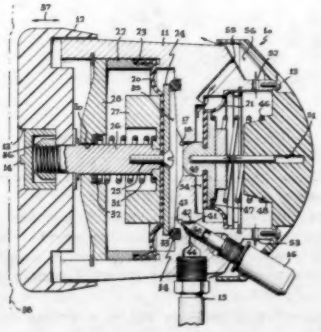
Filed May 14, 1981, Ser. No. 263,852
Int. Cl.³ A61H 1/02
U.S. Cl. 128—25 A 9 Claims

1. An eye treatment device comprising:
a unit to be placed against the eye and forming a chamber containing a liquid under pressure;
said chamber having a flexible wall exposed at one side to the pressure of said liquid and whose opposite side is adapted to be received adjacent the eye and to communicate the pressure of said liquid thereto; and
means for applying to said liquid in the chamber a pressure which fluctuates to exert a fluctuating massaging force to the eye through said flexible wall;
said flexible wall being constructed and adapted, when said opposite side thereof is placed against the eye, to assume a concave curvature at said opposite side conforming to the eye to apply said massaging force over a substantial area of the eye.

4,387,708
PNEUMATIC PERCUSSOR

James E. P. Davis, 2510-8 Arizona Ave., Santa Monica, Calif. 90404

Filed May 18, 1981, Ser. No. 264,970
Int. Cl.³ A61H 1/00
U.S. Cl. 128—55 7 Claims

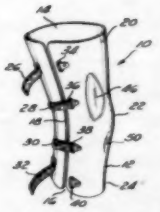


1. A pneumatic percussive apparatus comprising the combination of:
a cylindrical body having a central bore;
a front and a rear diaphragm means coaxially disposed in said body central bore;
a partition disposed between said diaphragm means across said body central bore defining a pressure chamber and a relief chamber between its opposite sides or faces and an associated one of said diaphragm means;
means for pressuring said pressure chamber with a compressed gas so as to actuate said first diaphragm means;
valve means operably carried by said rear diaphragm means in cooperation with said body partition to relieve excessive pressure in said pressure chamber via said relief chamber by venting to atmosphere;
a weighted applicator pad secured to said front diaphragm means for imparting oscillatory impacting force via said partition and ultimately to a patient in response to cyclic changes of pressure in said pressure chamber;
said front diaphragm means includes a hammer carried on one side of said front diaphragm means and a front plate carried on the other side of said front diaphragm means;
an impact resilient ring carried on said partition;
an impact spring operably coupled to said first diaphragm means for urging said front diaphragm means including said hammer against said impact ring;
spring biasing means yieldably urging said valve means via said rear diaphragm means to close communication between said pressure chamber and said relief chamber;
a dome shaped, hand fitting cover carried on said body for covering said rear diaphragm means and said valve means; and
silencing vent means in fluid communication with said relief chamber through said rear cover.

4,387,709
KNEE BRACE

C. Anthony Shen, 13800 Arizona St., Suite 101, Westminster, Calif. 92683

Filed Jul. 13, 1981, Ser. No. 282,432
Int. Cl.³ A61F 5/04
U.S. Cl. 128—87 R 6 Claims



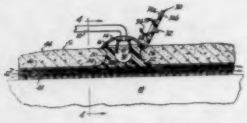
1. A device for immobilizing an individual's knee comprising:
an open-ended integral body formed into a substantially cylindrical tubular shell of semi-rigid material to provide substantial structural strength and secure immobilization, said shell having thigh, knee, and calf portions shaped to cover an individual's lower thigh, knee, and upper calf, respectively;
said body having a narrow longitudinal opening extending the length of said shell for permitting said shell to be slipped on and off the individual;
said tubular shell, at said thigh and calf portions including indentations which provide flat areas to prevent rotation of an individual's leg within the device; and
said thigh portion extending at a sufficient angle from the calf portion to produce ligament relaxation of the individual's knee in a flexed position.

4,387,710

VENTILATED CAST STRUCTURE AND METHOD OF PRODUCING THE SAME

John C. Beatty, III, 2755 Parkridge Dr., Ann Arbor, Mich. 48103

Filed Sep. 21, 1981, Ser. No. 304,151
Int. Cl.³ A61F 5/04
U.S. Cl. 128—91 R 12 Claims



1. A structural assembly providing a flow path for temperature and humidity controlled gas between a body member and a cast located thereon to effect ventilation therebetween, comprising a first relatively thick porous layer supported by a body member and providing a plurality of uninterrupted flow paths for randomly distributing gas flowing between said member and a cast located thereon, a second porous layer immediately adjacent said first layer providing a barrier against ingress of cast material during molding of said material to the body member; a passaged socket member adapted to be located in contact with said first and second porous layers for directing temperature and humidity controlled gas from a source through said first porous layer to effect ventilation between said body member and said cast; and a cover member adapted to be seated upon said socket member for directing gas from a source through said socket member and through said first porous layer at controlled temperature and humidity.

4,387,711

MEDICAL DEVICE WITH INFLATABLE CUFF

Jack D. Merry, Queensbury, N.Y., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jan. 27, 1981, Ser. No. 228,978
Int. Cl.³ A61M 25/00
U.S. Cl. 128—207.15 1 Claim

1. A medical device comprising:
(a) an elongated tube;
(b) an inflatable cuff surrounding said tube, said cuff being inflatable by air supplied thereto to engage the wall of a body cavity; said cuff being formed of polyvinylidene chloride-polyvinyl chloride copolymer.

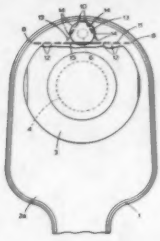
4,387,712

SURGICAL COLLECTION BAGS

Peter J. Briggs, Sompting, and Steven Carpenter, Chichester, both of England, assignors to Matburn (Holdings) Limited, London, England

Filed Jul. 16, 1979, Ser. No. 57,700
Claims priority, application United Kingdom, Jul. 19, 1978, 30349/78; Nov. 16, 1978, 44769/78
Int. Cl.³ A61F 5/44
U.S. Cl. 604—333 4 Claims

1. A surgical collection bag having two opposed walls secured together at their perimeter, one of said walls having a first opening in the surface thereof to provided an inlet into said bag, a second opening in said one of said walls spaced above said first opening to provide a vent for the passage of gases to the environment, a weld positioned between said first and second openings and connecting together said opposed walls to provide a seal interposed between said first and second openings, said seal having at least two spaced openings therein of preselected length to substantially prevent the passage of solid and liquid material therethrough, and a deodorizing filter



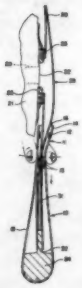
covering said vent said opposed walls being secured together by a perimeter weld, a first internal weld extends across the bag between the inlet and the vent to secure the opposed walls together, the said first weld having ends spaced from the perimeter weld to provide at each end of the weld a gateway through which gases may pass, further internal welds running from the first internal weld towards the perimeter weld with the vent between them, the said further welds having ends spaced from the perimeter weld to provide additional gateways through which gases may pass before reaching the vent.

4,387,713

DISPOSABLE DISCHARGE COLLECTOR FOR A DRAINABLE STOMA POUCH WITH WIPER

John R. Calanni, 413 S. Diamond St., Ravenna, Ohio 44266

Filed Jul. 17, 1981, Ser. No. 284,409
Int. Cl.³ A61F 5/44
U.S. Cl. 604—333 10 Claims

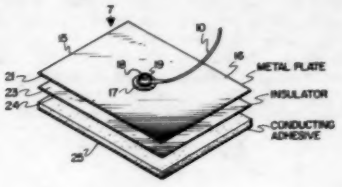


1. A disposable discharge collector for a stoma pouch having a drain opening therein, comprising:
bag body means for receiving the discharge from the stoma pouch and permitting the sanitary disposal thereof, said bag body means having flexible walls and an opening therein suitable to receive the drain opening end of the stoma pouch,
locking means adjacent said bag body opening for providing a liquid-tight closure of said bag body, and
wiper means in fixed, proximate spatial relation to said locking means for forcing with a continuous manual stroke over the stoma pouch substantially all discharge in the stoma pouch into the discharge collector without spillage.

4,387,714
ELECTROSURGICAL DISPERSIVE ELECTRODE

Leslie A. Geddes; Joe D. Bourland, both of West Lafayette, and John A. Pearce, Battleground, all of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed May 13, 1981, Ser. No. 263,212
Int. Cl.³ A61B 17/39
U.S. Cl. 128—303.13 4 Claims



1. A hybrid capacitively-conductively coupled dispersive electrode, comprising:

an electrically conductive element adapted to be electrically connected with an electrosurgical unit capable of providing a therapeutic signal to a patient, said conductive element having an inner portion;

an insulating element having inner and outer portions with said outer portion of said insulating element engaging and covering said inner portion of said conductive element to prevent ohmic contact of said inner portion of said conductive element with the skin of a patient during normal use of said electrode; and

an electrically conductive adhesive having inner and outer portions with said outer portion of said adhesive engaging said inner portion of said insulating element and said inner portion of said adhesive being formed so as to be engageable with the skin of a patient receiving said therapeutic signals from said electrosurgical unit to effectively enable uniform contact of said skin with said conductive adhesive to provide electrolytic communication through the skin to the patient and to establish capacitive-coupling between said conductive element and said conductive adhesive when said inner portion of said adhesive is engaged with said skin with said established capacitive-conductive coupling providing low impedance while retaining the uniform temperature distribution of capacitively-coupled electrodes.

4,387,715
SHUNT VALVE

Salomon Hakim, Bogota, Colombia, and Carlos A. Hakim, Fort Lauderdale, Fla., assignors to Hakim Company Limited, Saint Vincent, British West Indies

Continuation-in-part of Ser. No. 190,018, Sep. 23, 1980, Pat. No. 4,332,255, which is a continuation-in-part of Ser. No. 2,354, Jan. 10, 1979, abandoned. This application Apr. 28, 1982, Ser. No. 372,813
Int. Cl.³ A61M 27/00
U.S. Cl. 604—9 9 Claims

1. In a surgically implantable shunt system in which cerebrospinal fluid is vented from a cerebroventricular catheter to a drainage catheter, a valve for presenting a precisely controllable back pressure to the ventricles, said valve comprising:

an elongate, hollow valve body;

a flat plate partitioning said valve body so as to form an inlet chamber and an outlet chamber, said ventricular catheter being coupled to said inlet chamber and said drainage catheter being coupled to said outlet chamber, said plate being provided with a circular aperture connecting said inlet and outlet chambers;

a spherical ball of diameter larger than said aperture for controllably restricting flow through said aperture;

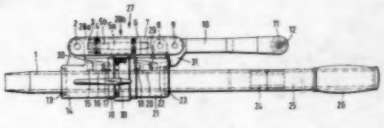
a spring including a cantilevered flat portion overlying said ball and biasing it against the circular periphery of said aperture whereby a circular seal is selectively effected between said ball and said plate, providing a precisely defined back pressure with low hysteresis and low susceptibility to bridging by debris;

wherein said spring comprises a central portion extending from a rear end thereof and adapted for overlying said ball and a pair of arms flanking said central portion and extending from said rear end, the ends of said arms adapted for attachment to said flat plate.

4,387,716
APPARATUS FOR USE IN LIVESTOCK OBSTETRICS

Georg Uhlmann, Koblenz, Fed. Rep. of Germany, assignor to Rheinetechnik, Weiland & Kaspar KG, Neunkirchen, Fed. Rep. of Germany

Filed Apr. 16, 1981, Ser. No. 254,623
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014301
Int. Cl.³ A61D 1/08
U.S. Cl. 128—352 8 Claims



1. An apparatus for use in livestock obstetrics, comprising: means adapted to bear against the body of the dam, and comprising a rod, two slides on the rod with means for alternately displacing and locking the slides along the rod, said slides having means for progressive tensioning of a sling for the offspring, a tensioning lever hinged to one slide, a two part intermediate lever having one part hinged to the tensioning lever at a location different than said one slide, the other part of the intermediate lever being hinged to the other slide, and resilient means actuated by said tensioning lever for allowing the parts of the intermediate lever to pull apart at a predetermined load, said tensioning lever being hinged to the slide that is remote from the dam when the apparatus is in use, and means actuatable by said tensioning lever for unlocking the slides from said rod, said tensioning lever becoming ineffective at said predetermined load and being thereupon able to actuate said resilient means, said resilient means being adjustable to a desired load and providing a force against which the two parts of said intermediate lever can be pulled apart.

4,387,717
PACER INTERNAL CARDIAC ELECTROGRAM SENSING SYSTEM

Robert R. Brownlee, State College; Howard C. Hughes, Jr., Cornwall; Paul H. Neff, Bellefonte, all of Pa., and G. Frank O. Tyers, Vancouver, Canada, assignors to Research Corporation, New York, N.Y.

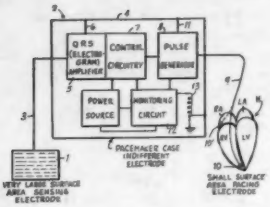
Filed Oct. 3, 1980, Ser. No. 193,746
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG 10 Claims

1. A system, usable with a pacemaker containing heart-

stimulating pacing circuitry including a QRS amplifier circuit, for sensing the cardiac electrical activity of a patient in whom the pacemaker is implanted to obtain an optimum cardiac electrogram signal and comprising:

casing means for housing said heart-stimulating pacing circuitry within the patient, at least a portion of the exterior of said casing means being electrically conditioned to act as an indifferent electrode;

pacing electrode means, implanted in the patient and operatively connected between said heart-stimulating pacing circuitry and the patient's heart, for conducting stimulating electrical pulses from said pacing circuitry to the heart; and



a sensing electrode means, operatively connected to said indifferent electrode and to said QRS amplifier circuit of the pacing circitry and implanted in the patient at a selected position relative to the heart and said indifferent electrode and spaced from said pacing electrode means, for sensing cardiac electrical signal vectors with ventricular and atrial depolarization signals of comparable magnitude with respect to each other as in the patient's cardiac electrogram and conducting the sensed signals to said QRS amplifier circuit with minimized cross coupling of said stimulating electrical pulses and after potentials from said pacing electrode means.

4,387,718

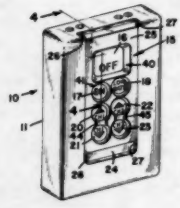
CONTROL COVER FOR NERVE STIMULATOR

Mark R. Bilitz, Minneapolis, and Dale A. Dickson, Fridley, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 30, 1981, Ser. No. 259,100

Int. Cl.³ A61N *1/00*

U.S. Cl. 128—419 R **10 Claims**



1. A tissue stimulator, comprising:

a housing adapted to be worn or carried by a user of the stimulator;

circuit means contained within said housing for producing output stimulating pulses;

user operated controls mounted to said housing and electrically connected to said circuit means for controlling the operating thereof; and

a control cover having apertures through which said controls may be accessed, and means for moveably connecting said cover to said housing with said apertures aligned with the positions of said controls when the control cover is in one position to permit access to the controls, and with the apertures out of alignment with the controls when the control cover is in a second position so that the cover blocks access thereto.

4,387,719

CONTROL CIRCUIT OF A THERAPEUTIC STIMULATOR FOR THE URINARY INCONTINENCE

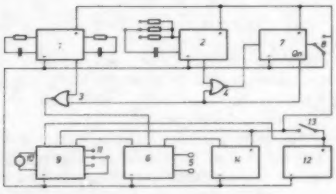
Stanislav Plevnik, Brezovica pri Ljubljani; Peter Vrtacnik, Kamnik; Matija Malezic, Ljubljana; Marino Lukezic, Portoroz; Uros Stanic, and Pavel Oblak, both of Ljubljana, all of Yugoslavia, assignors to Gorenje Tovarna Gospodinjske Opreme N.Sol.O. Velenje, Valenje, Yugoslavia

Filed Oct. 23, 1981, Ser. No. 314,455

Claims priority, application Yugoslavia, Oct. 23, 1980, 2725/80

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—421 **1 Claim**



1. Control circuit of a therapeutic stimulator for the urinary incontinence, characterized in that the output of the pulse generator (1) is connected to the first input of the NOR gate (3), the second input of which is connected to the output (Q_n) of the binary counter (7), the output thereof being connected to the input of the final stage (6) provided with stimulation electrodes (5), and that the output of the fundamental frequency generator (2) is connected to the first input of the NOR gate (4), the output thereof being connected to the input of the binary counter (7), the "reset" input of which is over the switch (8) connected to the positive or negative pole of the supply and the output (Q_n) being connected to the second input of the NOR gate (4).

4,387,720

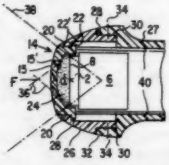
TRANSDUCER ACOUSTIC LENS

David G. Miller, Andover, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 29, 1980, Ser. No. 221,080

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **5 Claims**



1. A transducer for use in transmitting acoustic signals into a body of a patient to be examined and translating reflections thereof into electrical signals, comprising

a base,

an array of crystals mounted on said base,

a metal shield covering the ends of the said crystals remote from said base and in electrical contact therewith,

a first lens element comprised of electrically insulating material

having an acoustic impedance approximating that of the tissue under examination and an acoustic propagation velocity greater than that of the tissue under examination, said first element having a concave inner surface and an outer surface, said surfaces being shaped so that parallel rays approaching said inner surface are focussed on the other side of said outer surface,

means for mounting said first lens element with its concave inner surface facing said metal shield and on the side of said shield opposite said crystals, and

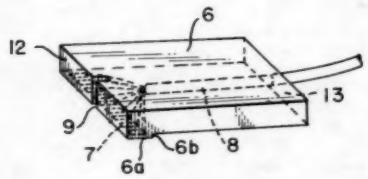
a second lens element comprised of electrically insulating material contained between the inner concave surface of said first lens element and said metal shield, said latter material having an acoustic impedance and propagation velocity approximating those of the tissue under examination.

4,387,721

ULTRASONIC PROBE HAVING MEANS FOR RECEIVING A PUNCTURING CANNULA THERETHROUGH

Susumu Enjoji, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 8, 1981, Ser. No. 252,239
Claims priority, application Japan, May 30, 1980, 55-71539
Int. Cl.³ A61B 10/00
U.S. Cl. 128—660 **4 Claims**



1. An ultrasonic probe for insertion substantially wholly into the human abdomen, and having means for receiving a puncturing cannula therethrough, the probe comprising:

a substantially rectangular parallelepiped-shaped support member, the height of said member being relatively much less than the length or width, thus forming top and bottom surfaces of the member of much larger area than any other surfaces;

a plurality of ultrasonic transducer elements arranged in at least one row in, and closely adjacent to one edge of, the bottom surface of the support member, said row extending substantially the length of said edge but being of relatively short width for occupying only a relatively small portion of said bottom surface;

cable means for individually connecting said transducer elements to an external processing unit; and

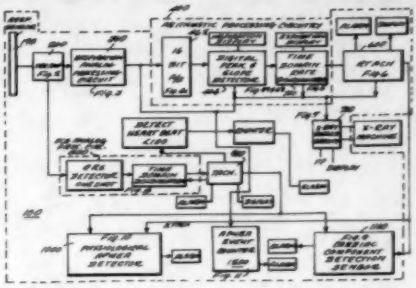
a narrow slot for guiding the puncturing cannula, said slot opening into a first face of said parallelepiped-shaped member perpendicular to said bottom surface and adjoining said row of transducer elements, said slot being centrally positioned relative to said row of transducer elements and permitting substantially no lateral movement of the cannula parallel to said row.

4,387,722

RESPIRATION MONITOR AND X-RAY TRIGGERING APPARATUS

Kenneth L. Kearns, 12822 N. 26th Dr., Phoenix, Ariz. 85029

Division of Ser. No. 963,352, Nov. 24, 1978, Pat. No. 4,289,142.
This application Apr. 6, 1981, Ser. No. 251,713
Int. Cl.³ A61B 5/08
U.S. Cl. 128—716 **8 Claims**



1. Apparatus for generating a triggering signal to an X-ray machine comprising:

operator actuated means for selectively generating an ARM signal indicative of a desired armed condition;

means for generating an analog respiration signal directly representative of the respiration of a subject;

means, responsive to said analog respiration signal, for periodically sampling said analog respiration signal and generating sample indicative of said samples;

amplitude discriminator means, responsive to said sample signal, for generating a signal indicative of the difference between the instantaneous sample and a mean sample, said mean sample being the last preceding sample differing from the preceding mean sample by a predetermined value;

means, cooperating with said amplitude discriminator means for generating a signal change signal indicative of a change in sign of said difference in a predetermined direction;

means for storing indicia of the modified value of the next successive sample occurring after generation of said sign change signal, the value of said next successive value being modified by said predetermined value;

time discriminator means, responsive to said sign change signal, for generating an extrema signal, said time discriminator means including means for inhibiting generation of said extrema signal in response to sign change signals within a prescribed time period after a preceding sign change signal, said first prescribed time period being in accordance with the maximum rate of physiological respiration of said subject;

means, responsive to said extrema signal, for generating a signal indicative of a second prescribed time period after generation of said extrema signal, said second prescribed period being in accordance with the inspiratory to expiratory action of said subject;

means, responsive to said sample signal and a signal indicative of said stored indicia of modified value, for generating an actuation signal when the value of the instantaneous sample approximately equals said modified value; and

logic means, responsive to said actuation signal, for selectively generating, if not inhibited, said triggering signal;

first inhibit means, responsive to said arm signal, for inhibiting said logic means with respect to any actuation signal generated in the absence of said desired armed condition; and

second inhibit means, responsive to said signal indicative of said second prescribed period, for inhibiting said logic

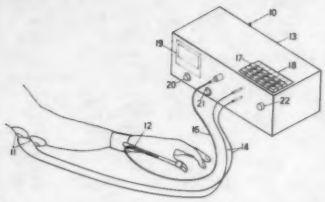
means with respect to any actuation signal generated during said second prescribed time period after generation of a preceding sign change signal.

4,387,723

METHOD AND APPARATUS FOR DETERMINING THE LEVEL OF NEUROMUSCULAR BLOCK IN A PATIENT

John L. Atlee, III, Deforest, Wis., and Maximillian D. Fiore, Livermore, Calif., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 9, 1980, Ser. No. 214,783
Int. Cl.[3] A61B 5/05
U.S. Cl. 128—734 14 Claims



1. Apparatus for determining the level of neuromuscular blockage in a patient, comprising:

(a) stimulator means responsive to a control signal for supplying an electrical pulse to electrodes attachable to a patient in response to the control signal received by the stimulator means;

(b) force transducer means attachable to the thumb of a patient for measuring the adduction of the patient's thumb evoked in response to a stimulus applied by the electrodes, the force transducer means providing electrical output signals proportional to the magnitude of the thumb adduction;

(c) controller means for comparing the output of a signal from the force transducer means with a threshold value, selected to be greater than background noise and unstimulated, random thumb movements, to determine if a significant response is present and for providing a magnitude output signal indicative of whether the magnitude of the signal from the force transducer means is less than or greater than the selected threshold value, the controller means also providing a control signal to the stimulator means to initiate stimulation of the patient; and

(d) display means receiving the magnitude output signal from the controller means for providing a visual display to the operator in response to the magnitude output signal to indicate to the operator whether the magnitude of the transducer means output signal is less than or greater than the selected threshold value.

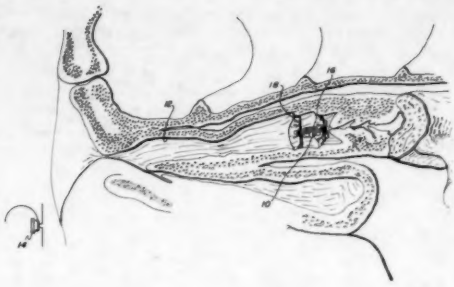
4,387,724

METHOD FOR REMOTELY MONITORING THE LONG TERM DEEP BODY TEMPERATURE IN FEMALE MAMMALS

David L. Zartman, Las Cruces, N. Mex., assignor to New Mexico State University Foundation, Inc., Las Cruces, N. Mex.

Filed May 12, 1980, Ser. No. 149,250
Int. Cl.[3] A61B 10/00
U.S. Cl. 128—736 5 Claims

1. The improved method for detecting a feverish condition in mammalian females which comprises the steps of: attaching a battery powered radio telemetric temperature measuring device of a size adapted for insertion into the uterine canal to an expandable anchor of approximately the same size in collapsed condition as said telemetry device, collapsing the anchor and inserting it while thus collapsed along with the telemetry device attached thereto the vagina to a depth where the assembly thus formed lies adjacent the cervix, expanding the anchor "in situ", monitoring the temperature daily from a remote external location at approximately the same time each day for a period not less than approximately one complete estrous cycle, and comparing the temperature each day with



the average temperature over the immediately preceding approximately ten day period to detect any abrupt changes therein of a magnitude several tenths of a °C. higher than the deviation in temperature upon which said average temperature was determined.

4,387,725

DEVICE FOR USE IN THE COLLECTION AND TRANSPORTATION OF MEDICAL SPECIMENS

John D. Mull, 4088 Lakeshore Rd., E., Burlington, Ontario, Canada (L7L 1A1)

Filed Feb. 10, 1981, Ser. No. 233,273
Int. Cl.[3] A61B 10/00; A12K 1/00
U.S. Cl. 128—759 4 Claims

1. A device for use in the collection and transportation of medical specimens comprising:

a receptacle in the form of an elongate transparent tube having a closed and an open end;

a swab comprising an elongate element having an absorbent pad at an outer end thereof, and a cap at its opposite end, the cap being adapted to be fitted to said tube so as to close said open end and the element being arranged to extend outwardly from the cap into the tube when the cap is in place on the tube;

a body of media material disposed in said tube adjacent the closed end thereof; and,

a penetrable septum positioned in the tube at a spacing from said closed end selected so that said media material substantially fills the space between the septum and said closed end, the swab being dimensioned so that its said outer end will penetrate the septum when the cap is in its said position closing the open end of the tube, whereby the absorbent pad with the specimen thereon will become immersed in the media material;

said septum comprising a sleeve retained inside said tube and defining an internal passageway and a diaphragm normally closing said passageway, said passageway being dimensioned to permit the swab to pass therethrough when the cap is moved to said position closing the open end of the tube, and said diaphragm being received in an internal annular recess in side sleeve defined at the side of

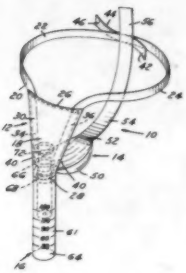
the diaphragm remote from the media material by an annular lip adapted to prevent dislodgement of the diaphragm in a direction away from the media material, and at the opposite side of the diaphragm by portions of the sleeve adapted to permit the diaphragm to be displaced from said recess by said swab in penetrating the septum.

4,387,726

DISPOSABLE URINE COLLECTION DEVICE FOR HUMAN MALES

Ruthie Denard, 74 Garfield, Detroit, Mich. 48201

Filed Jun. 18, 1981, Ser. No. 274,879
Int. Cl.³ A61F 5/44
U.S. Cl. 128—760 **11 Claims**



1. A disposable urine collection device for human males comprising:

(a) a combined pubic arch support and belt adapted to fit and to be worn around the waist and the lower part of the male abdomen and including an arch support for covering the pubic area and a belt, said arch support being in the form of a trapezoid, having upper and lower horizontal edge portions of varying lengths, with the longest length located at the upper edge portion of the support, said arch support including a pair of vertically extending and converging edge portions between said upper and lower horizontal edge portions, said belt including a pair of strands having end portions secured to said arch support and to said upper edge thereof, the other end portions of said strands including fastening means for removably securing the strands together around the waist of the user;

(b) a combined scrotal support and belt including an opened scrotal support having one edge secured to said arch support, said last mentioned belt being connected on one end to the opposite edge of said scrotal support and adapted to extend the buttock of the user, said last mentioned belt having on the other end thereof means for removably connecting same to said first mentioned belt;

(c) a urine collecting structure carried by, secured to and depending from said lower edge portion of said arch support, said structure including an inner container into which the penis is adapted to extend, the inner structure having a relatively small opening in the bottom thereof; said structure having an outer container into which said inner container extends, said outer container having a length greater than the length of said inner container whereby when the device is in use the urine discharged through the penis will drain through said small opening into said outer container which collects and stores same; the upper edge portion of said inner container being sealingly secured to the upper edge portion of said outer container to provide a fluid tight seal adjacent said arch support which prevents leakage of urine from said outer container;

(d) said inner and outer containers being in the form of cylinders, with the outer cylinder being closed and sealed through its entire extent and said inner cylinder being opened at the top and otherwise closed except for said small opening;

(e) the bottom of said inner container being provided with a flap valve which prevents reverse flow of the urine from the outer container into the inner container via said small opening;

(f) a first relatively thin adjustment disc having a center opening sleeved over the upper end portion of said inner cylinder to permit the length of said inner cylinder to be adjusted to fit the length of the penis, with the excess length of the inner cylinder at the upper end portion thereof being adjusted and folded upon itself in layers and held in an adjusted position by said first disc;

(g) and a second relatively thin disc having a center opening and adapted to be placed over the penis prior to the insertion of same into said inner cylinder to provide a cushion or pad for the scrotal area of the user to avoid contact with the folded upper end portion of said inner cylinder; said second disc overlying and contacting the folded upper end portion of said inner cylinder.

4,387,727

COAXIAL SERVICE KIT

Richard D. Sandstrom, Scandia, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 30, 1981, Ser. No. 248,735
Int. Cl.³ A61N 1/04
U.S. Cl. 128—784 **16 Claims**

1. Apparatus for splicing the cut end of a body implantable lead of the type comprising:

an outer insulating sheath having a cut end and a lumen open to said cut end;

an outer conductor coil having a cut end and a lumen open to said cut end, mounted within the lumen of said outer insulating sheath;

an inner insulating sheath having a cut end and a lumen open to said cut end, mounted within the lumen of said outer conductor coil; and

an inner conductor coil having a cut end and a lumen open to said cut end, mounted within the lumen of said inner insulating sheath;

said apparatus comprising:

a conducting pin for insertion into the lumen of said inner conductor coil;

insulating sleeve means located coaxial to said conducting pin for preventing said conducting pin from contacting said outer conductor coil;

first means for electrically coupling to said conducting pin; and

second means for electrically coupling to said outer conductor coil.

4,387,728

CIGARETTE FILTER

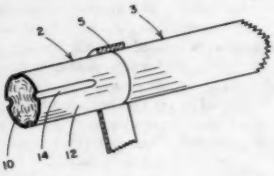
Martin L. Reynolds, and Robert R. Johnson, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Mar. 19, 1981, Ser. No. 245,428
Int. Cl.³ A24D 3/04, 3/18
U.S. Cl. 131—336 **5 Claims**

1. In a cigarette having a filter attached thereto wherein said filter and said cigarette are attached by a small strip of material,

comprising: said filter being a porous rod of cylindrical configuration;

a smoke impervious wrapper extending longitudinally along said rod from at least one end thereof and circumscribing said rod leaving flow-through opposed ends of said rod, said wrapper having a plurality of longitudinally extending grooves circumferentially spaced therearound embedded into the filter rod and that portion of the wrapper defining the grooves remaining smoke impervious, said



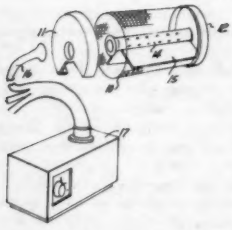
grooves being open ended at and extending from at least one of said ends a distance less than the length of the filter rod, the improvement being characterized in that for lowering the "tar" by ventilation the filter is connected with a cigarette or tobacco column only with said small strip of material, when attached to said filter, said strip has a width less than the distance between the groove and the tobacco column whereby said strip does not interfere with ventilating air flowing along said groove when in use.

4,387,729

EGYPTIAN HAIR DRYER

Lawrence H. Abdalla, P.O. Box 3078, Center Line, Mich. 48015

Filed Feb. 15, 1979, Ser. No. 12,572
Int. Cl.³ A45D *2/12*
U.S. Cl. 132—33 R **4 Claims**



1. A hair dryer and curler comprising an elongated perforated tube upon which a lock of hair may be wound;

first and second impervious caps, each having an annular flange snugly anchored over the ends of said tube;

said first cap having a central aperture adapted to snugly receive a pressurized heated air supply conduit;

an elongated air delivery tube at one end centrally secured to said second cap and closed thereby, coaxial to and spaced radially inward of said perforated tube, having an open end connected to said first cap in registry with its aperture, for receiving pressurized heated air;

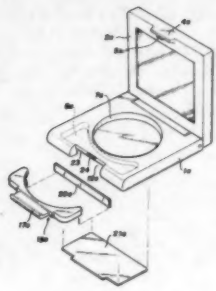
said air delivery tube having a plurality of apertures therethrough arranged in a pattern along its length over the top of said perforated tube, portending an arc in the range of 180 degrees to 270 degrees, whereby the heated air flows outwardly of the air delivery tube and said perforated tube away from the users scalp.

4,387,730

VANITY CASE

Yuji Shioi, Tokyo, Japan, assignor to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1981, Ser. No. 290,968
Claims priority, application Japan, Mar. 23, 1981, 56-38911
Int. Cl.³ A45D *33/00*
U.S. Cl. 132—83 R **4 Claims**



1. A vanity case comprising:

a receptacle member for containing cosmetic material;

a cover member;

said receptacle and cover members being hinged together at respective rear ends thereof;

a latch tongue integrally and unitarily formed with one of said cover and receptacle members;

a recess formed in the other of said cover and receptacle members and extending therein from the front end thereof;

said recess being partially defined by an arc-shaped wall which is curved outwardly toward said front end;

a slider element slidably disposed in said recess and having a pair of arc-shaped arms and an outer end portion, said outer end portion being positioned closely adjacent to the front end of said one member when said cover member is in a closed position over said receptacle member, said outer end portion including means for, upon inward movement of said slider element, forcing said one member away from said other member;

said slider element having therein an inwardly extending cavity, said latch tongue of said one member being received in said cavity for engagement therewith when said slider element is in an outermost position thereof, and said latch tongue being moved out of said cavity by said inward movement of said slider element; and

a leaf spring provided between said arms of said slider element and bent by said arc-shaped wall for urging said slider element outwardly to normally hold the same in said outermost position.

4,387,731

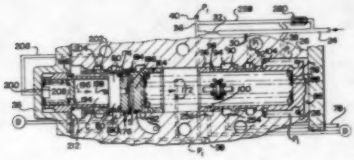
MODULATED TRANSMISSION WITH MODULATOR-LOAD-PISTON LOADING AT LINEAR RATE AFTER FULL RESET

Probir K. Chatterjea, Mt. Prospect, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 37,596, May 10, 1979, Pat. No. 4,311,068, which is a continuation-in-part of Ser. No. 890,002, Mar. 24, 1978, Pat. No. 4,216,851, which is a division of Ser. No. 693,469, Jun. 7, 1976, Pat. No. 4,135,610. This application Oct. 29, 1981, Ser. No. 316,005
Int. Cl.³ F16H *47/06*; F16D *33/06*
U.S. Cl. 137—115 **7 Claims**

1. In a rate of rise valve assembly (26) for applying clutch engagement pressure (P1) in the clutch-connected line (24) of

a power shift transmission, said line extending upstream and downstream of a fill orifice (32) included therein for transmitting the clutch pressure (P1) on the downstream side, and susceptive of causing an unwanted substantial drop in clutch pressure (P1) upon a substantial increase in fill orifice flow, said assembly having a signal pressure chamber (82) spaced from a bore end (86) in said assembly, and a modulating valve (58) in said bore end (86) in said assembly connected to said line and having a load piston (164) movably mounted in said chamber in the space intermediate to said modulating valve, and operatively connected for loading the latter under load of signal pressure (S), and a rate of rise orifice (186) effective to communicate flow into the signal chamber (82) at a relatively reduced signal pressure (S) therein in response to an excess of



pressure being fed to the rate of rise orifice (186), said modulating valve operating under a modulating pressure and on the bleed hole principle to bleed off less and less pressure from said line into the bleed hole by controlled modulation so as to raise pressure more and more in said line, the improvement comprising:

means (212) of feeding-back clutch-pressure (P1) connected to the rate of rise orifice, for delivering clutch pressure as the excess pressure fed thereto and connected to the modulating valve as the operating pressure thereon modulated thereby; and

flow means (28) connecting said line (24) to the bleed hole (254) in a path including the modulating valve (58) to modulate the flow means and the pressure as accordingly modulated in said line.

4,387,732

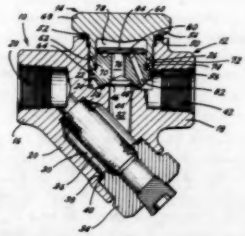
STEAM TRAP INCLUDING INTERCHANGEABLE BODY MEMBER AND INSERT ASSEMBLY

Heinz K. Hetz, Holicong, Pa., assignor to YWHC, Inc., Wilmington, Del.

Division of Ser. No. 829,008, Aug. 30, 1977, Pat. No. 4,288,032, which is a continuation-in-part of Ser. No. 629,649, Nov. 6, 1975, abandoned. This application May 7, 1981, Ser. No. 261,089

Int. Cl.³ F16T 1/16

U.S. Cl. 137—183 **7 Claims**



1. An insert assembly located to be utilized with a valve body member to form a steam trap, said insert assembly comprising an insert member and a bonnet member joined together to form a control chamber, one of said members including a threaded portion and a wrenching configuration for cooperation with a tool to effect threaded engagement between said threaded portion and a threaded portion on said valve body member, a first bearing surface formed on said insert member; a skirt depending from said insert member about and below said first bearing surface, a first sealing ring held by said depending skirt, a second bearing surface formed adjacent said wrenching configuration for seating on a second sealing ring carried on an outer surface of said valve body member, an inlet passageway formed in said insert member for communicating between said first bearing surface and said control chamber, an outlet passageway formed in said insert member for communicating between said control chamber and an outer surface thereof, and valve means carried in said control chamber for controlling flow.

4,387,733

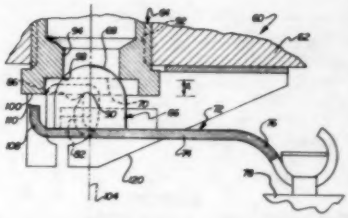
DUAL FULCRUM STEAM TRAP

Les Balazs, Brecksville, and Michael E. Winiasz, Lorain, both of Ohio, assignors to The Clark Reliance Corp., Cleveland, Ohio

Filed May 19, 1981, Ser. No. 265,340

Int. Cl.³ F16T 1/30

U.S. Cl. 137—185 **9 Claims**



1. A steam trap comprising a housing, a valve seat disposed in said housing and having a first circular orifice therethrough, a valve member having a hemispherical surface, said valve member being movable between a first position in which said hemispherical surface of said valve member sealingly engages said first orifice in said valve seat to block the flow of fluid through said first orifice and a second position in which said valve member is free of contact with said valve seat, said valve seat having a second circular orifice concentric with said first orifice and axially spaced therefrom, and said valve seat including pivot surface means integral with said valve seat and disposed in the diametrical plane of said hemispherical surface of said valve member which plane when said hemispherical surface of said valve member sealingly engages said first orifice passes through said second orifice, float means movable in response to changing condensate level, pivotable dual fulcrum lever means connecting said valve member and said float means for providing a relatively high mechanical advantage during initial movement of said valve member away from said valve seat and relatively lower mechanical advantage during subsequent movement of said valve member away from said valve seat, said dual fulcrum lever means including first fulcrum surface means for contacting said pivot surface of said valve seat during initial movement of said valve member away from said valve seat and second fulcrum surface means for contacting said pivot surface of said valve seat during movement of said valve member away from said valve seat subsequent to said initial movement.

4,387,734

APPARATUS AND METHOD FOR SPONTANEOUS MENISCUS GENERATION

Alexander S. Borsanyi, Corona del Mar, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

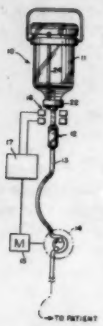
Filed Jul. 16, 1981, Ser. No. 283,984

Int. Cl.³ A61M 5/14

U.S. Cl. 137—206 **31 Claims**

1. An apparatus for converting a stream of fluid into a suc-

cession of discrete fluid segments with leading and trailing menisci, comprising a segment generator having a wall defining an elongated and downwardly-extending capillary passage having an inlet at one end and an outlet at the other end thereof, conduit means for conducting a generally continuous



stream of fluid to said inlet, said wall of said generator having at least one longitudinally-extending slit therethrough, said slit having one end disposed adjacent said inlet for initiating the generation of fluid segments and extending along said capillary passage to said outlet, said capillary passage being provided with a non-wettable surface.

4,387,735

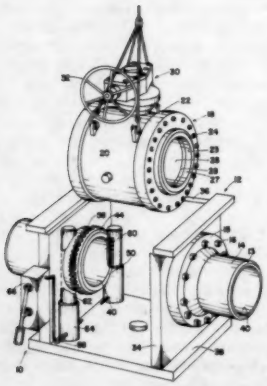
LINE REMOVABLE VALVE STRUCTURE WITH EXTENSIBLE SEAL RINGS ON PIPELINE SUPPORT STRUCTURE

Roger L. Ripert, Concord, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Feb. 16, 1982, Ser. No. 348,832

Int. Cl.³ F16K *43/00*

U.S. Cl. 137—315 **7 Claims**



1. In a line-removable valve structure comprising:

a pipeline-support structure; and

a valve cartridge received in said structure;

said valve cartridge including:

a body containing a movable valve closure member and end closures with flow openings therein;

said support structure comprising:

a pair of opposing end plates with flow passageways therethrough;

means on the outboard sides of said end plates for connection thereof into a pipeline; and

rigid steel side members interconnecting said end plates;

means for sealing said valve cartridge between said end plates comprising:

a support structure seat ring carried on the inner surface of an end plate;

annular sealing means around the inwardly directed annular face of said seat ring;

an opposing sealing surface on one of said cartridge end closures around a flow opening;

complementary thread means on said seat ring and said end plate to move said seat ring along the axis of said flow passageway upon turning said seat ring through a rotational increment;

selectively operable means for producing said rotational increment of said seat ring, said selectively operable means including:

gear teeth at least partially around said seat ring; and

complementary gear teeth on said support structure for movement thereon so as to enable removal of said valve cartridge.

4,387,736

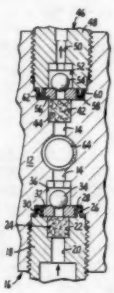
FLUID CONTROL APPARATUS

Emery Major, 1210 Brickyard Cove Rd., Point Richmond, Calif. 94801

Division of Ser. No. 91,726, Nov. 6, 1979. This application Oct. 26, 1981, Ser. No. 314,703

Int. Cl.³ F04B *11/00*

U.S. Cl. 137—550 **4 Claims**



1. In fluid control apparatus including mounting means defining a throughbore therein and at least one check valve assembly mounted on said mounting means, said check valve assembly including a valve assembly body portion defining an interior, the improvement comprising:

an annular boss comprising a portion of at least one of said mounting means and said valve assembly body portion;

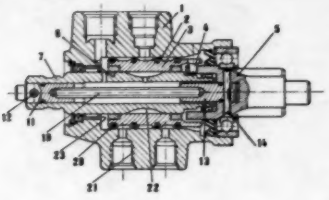
a resilient annular valve assembly seal positioned between said mounting means and said valve assembly body portion, said annular valve assembly seal having a central opening, an annular recess formed therein spaced from said central opening for receiving said annular boss and a radially outwardly projecting flange spaced outwardly from said annular recess and positioned between and in engagement with said mounting means and said check valve assembly body portion; and

a valve seat supported by said valve assembly seal and positioned within said central opening of said valve assembly seal, said valve seat defining a fluid flow passageway between said mounting means throughbore and said valve assembly body portion interior.

4,387,737
HYDRAULIC ASSISTED STEERING DEVICE FOR A MOTOR VEHICLE

André Tobiasz, Boulogne-Billancourt, France, assignor to Societe Anonyme DBA, Paris, France

Filed Jan. 12, 1981, Ser. No. 224,361
Int. Cl.³ B62D 5/08
U.S. Cl. 137—625.21 8 Claims

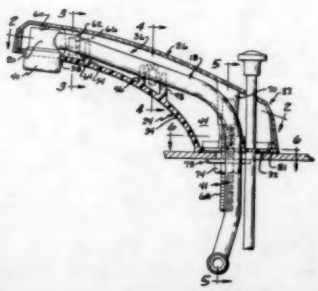


1. A hydraulic assisted steering device for a motor vehicle, of the type including a rotary distributor comprising a distribution sleeve extending from a steering control member, a rotor of generally tubular shape which is rotatably disposed within said sleeve, a torsion bar which is housed within said rotor and which has one end fixed to said rotor and the other end fixed to said steering control member, and a hydraulic circuit for producing a control value in response to an angular movement imparted to said rotor, characterized in that said torsion bar comprises an active portion of constant section made of high-resiliency steel and two end members made of ordinary steel, the ends of said active portion being respectively fixed in a blind bore formed in each of said end members and fixed thereto, said end members being respectively fixed with respect to said rotor and said steering control member.

4,387,738
SPREAD CENTER FAUCET

Rudy Y. Bisonaya, Oaklawn, and Gerald J. Farrell, Elmhurst, both of Ill., assignors to Elkay Manufacturing Company, Oak Brook, Ill.

Filed Mar. 30, 1981, Ser. No. 249,227
Int. Cl.³ E03C 1/02
U.S. Cl. 137—801 2 Claims



2. A spread center faucet for mounting on a sink between spaced hot and cold water valves, each having a supply conduit for connection to the faucet, said faucet comprising:

a continuous, curved spout tube having an inlet fitting at the end of a lower portion and a discharge head at the upper end of a terminal portion,

a hollow housing having a base member with a flat base section and an arched section leading therefrom to a discharge tip, and a spout cover removably secured to said base member by fasteners and defining with said base member an enclosed, elongated curved housing cavity extending from said flat base section to said discharge tip,

locking means within said cavity for securing and for orienting said spout tube in said housing cavity including means carried by said base member providing a longitudinally extending seat at an intermediate point of said spout tube,

a screw socket on said base member adjacent said seat,

a screw received in said socket for rigidly clamping said spout tube in said seat against longitudinal movement,

second means carried by said base member adjacent said opening in said discharge tip and defining a saddle for said spout tube aligning said discharge head with said discharge opening,

means including said cover for clamping said spout tube in said saddle,

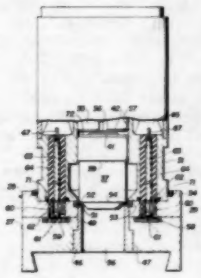
means defining an opening in said flat base section receiving and limiting movement of said lower portion of said spout tube, and

said lower portion of said spout tube projecting from said flat base section of said base member for connection of said inlet fitting beneath said sink to said supply conduits.

4,387,739
VALVE MODULE FOR DIGITAL COOLANT CONTROL SYSTEM

Edward J. Schaming, P.O. Box 1070, Butler, Pa. 16001

Filed Sep. 22, 1981, Ser. No. 304,674
Int. Cl.³ B05B 1/16
U.S. Cl. 137—884 12 Claims



1. In a valve module for a coolant system or the like, a head structure adapted for sealed attachment to a header, plural remotely controlled solenoid valves on the head structure, a single electrical receptacle common to the plural valves on the head structure, a printed circuit element common to the valves in the head structure and having electrical terminals adapted for connection with terminals of said receptacle on the head structure and having conducting strips defining separate circuits for said valves leading from the terminals of the printed circuit element, and each solenoid valve of the valve module having a pair of spring contacts connected with the coil of the valve and being biased into electrical engagement with terminal points on said conducting strips defining said separate circuits on the printed circuit element.

4,387,740
CAM-FLANGE

Hershel Vanzant, Tulsa, Okla., assignor to T. D. Williamson, Inc., Tulsa, Okla.

Filed May 15, 1981, Ser. No. 263,999
Int. Cl.³ F16L 55/10
U.S. Cl. 138—89 11 Claims

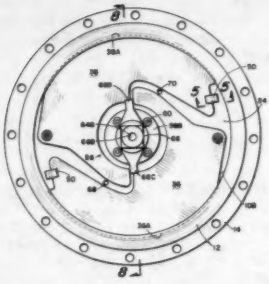
1. A flange and closure therefore comprising:

a flange body having a cylindrical opening therethrough and

having in the cylindrical opening a concentric internal groove;

a cylindrical closure plate for removably closing the opening in said flanged body, the closure plate having an external cylindrical surface the diameter of which is less than said opening in said flange, the closure plate being removably and sealably positionable in said flange opening;

a plurality of cam plates each hingeably affixed to said closure plate, each said cam plate having an outer semi-circular peripheral edge portion configured as the segment of a circle of diameter substantially equal the diameter of said flange internal groove, each such edge portion being of thickness less than the length of said groove in said flange and each cam plate having an integral inner portion defining an inner edge which is non-concentric with respect to said outer semi-circular peripheral edge, the inner edge providing a cam surface for hingeably displacing the cam plates inwardly and outwardly;



a cam plate actuator pivotally and coaxially affixed to said closure plate having an arm portion engaging each said cam plate's inner edges to forcibly retract said cam plates whereby the portions having said segmental circular edges are within the diameter of said closure plate when said actuator is rotated in one direction and to hingeably extend said cam plates whereby said semi-circular edges thereof extend within said flange groove when said actuator is rotated in the other direction to retain said closure plate in position within said flange opening.

4,387,741

ROTARY DOBBIES FOR WEAVING LOOMS

Joseph Palau, Duingt, and Pierre Bourgeaux, Poisy, both of France, assignors to S.A. des Etablissements Staubli, Faverges, France

Filed Mar. 16, 1981, Ser. No. 244,483

Claims priority, application France, Mar. 20, 1980, 80 06545

Int. Cl.³ D03C 1/00

U.S. Cl. 139—66 R **5 Claims**

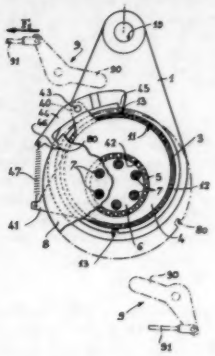
1. In a dobby of the rotary type having a dobby element for actuating each heddle frame of a weaving loom, the loom having a main shaft driven with intermittent rotational motion and having a reading device having control members located at element control stations adjacent to the shaft, each heddle frame actuating element comprising:

a connecting arm operative to actuate a heddle frame, the arm having a central opening loosely surrounding the shaft;

an eccentric member between the shaft and the connecting arm and having an outer surface on which the connecting arm is journaled at its central opening, and having an inner opening surrounding the shaft and journaled thereon, the inner opening being disposed eccentrically with respect to said outer surface, and the eccentric member having a pivot lug extending radially therefrom and offset laterally from said bead on the arm;

a driving disc carried by the shaft adjacent to the eccentric member and of diameter larger than the shaft, and the outer periphery of the driving disc having annularly spaced notches thereon; and

a rocking hook pivotally supported by the lug on the eccentric member and having a notch-engaging nose on one side



of the pivot disposed opposite the periphery of the disc, the rocking hook when located at a control station of the reading device being disposed to be selectively rocked by a control member to engage its nose into a notch of the periphery of the disc in order to couple the main shaft with the eccentric member.

4,387,742

WEAVING HEDDLE FRAME

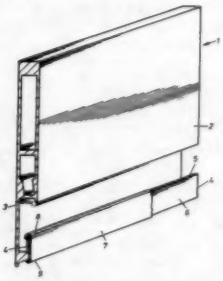
Martin Graf, Wuhrenbach, Switzerland, assignor to Grob & Co. Aktiengesellschaft, Horgen, Switzerland

Filed Jul. 11, 1980, Ser. No. 167,484

Claims priority, application Switzerland, Jul. 13, 1979, 6547/79

Int. Cl.³ D03D 9/00

U.S. Cl. 139—92 **2 Claims**



1. A heddle frame including frame staves of lightweight construction and of a predetermined hardness, each said frame stave having a front wall and having a back wall which includes an extension beyond a side edge of said front wall, a heddle carrying rod integrally connected with said back wall and being of the same lightweight construction and predetermined hardness as said frame stave, said rod having a longitudinal edge confronting said side edge of said front wall and having an outwardly facing front side, and said rod being disposed on one surface of said back wall extension for supporting heddles with laterally open end loops, a removable cover comprising a thin flexible plate of sheet metal in contact

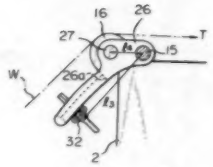
with said front side of said rod and engaging said longitudinal edge thereof, said cover having a hardness greater than the hardness of said rod and having a substantially U-shaped rim overlapping said longitudinal edge of said rod and engaging a back side of said rod, said cover having an angled rim in engagement with an edge of said rod lying opposite said longitudinal edge for permitting said cover to be snapped in place on said rod upon engagement of said U-shaped rim with said back side of said rod, whereby said cover provides resistance to rod wear caused by the heddles.

4,387,743

APPARATUS FOR REGULATING TENSION IN WARPS OF A WEAVING MACHINE

Hajime Suzuki, Anjo; Yoshifumi Umemura, Toyoake, and Masahiko Kimbara, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Apr. 8, 1981, Ser. No. 252,041
Claims priority, application Japan, Jun. 20, 1980, 55/84185
Int. Cl.³ D03D *49/04, 49/06*
U.S. Cl. 139—110 **8 Claims**



1. An apparatus for regulating tension in warps of a weaving machine comprising a tension lever swingably supported on said weaving machine and having a roller supported thereon for regulating the tension in warps delivered from a warp beam, a weight lever swingably supported on said weaving machine and having a load at one end thereof, and a link means operatively connecting said tension lever and said weight lever in such a manner that lever ratio in a system between said weight lever and said tension lever can be varied by displacing the connecting positions, characterized in that a guide roller means disposed at a place, where said link means is connected to said tension lever, and serving to guide relative movement between said link means and said tension lever while lever ratio varying operation takes places.

4,387,744

THREAD SEVERING MECHANISM ASSOCIATED WITH SHUTTLELESS LOOM

Kermit T. Newcomb, South Hill, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Apr. 1, 1981, Ser. No. 249,867
Int. Cl.³ D03D *47/36*
U.S. Cl. 139—429 **13 Claims**

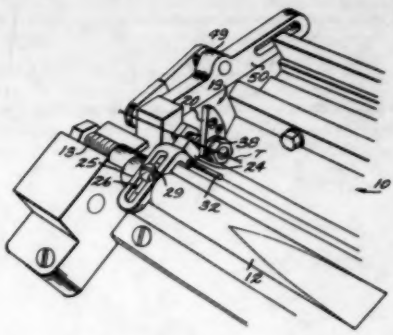
1. A thread severing mechanism comprising:

a cutting blade having a razor edge;

an anvil having a thread supporting surface, said thread supporting surface including a block of material having the blade-protection and thread-severing-facilitating properties of rubber;

means for effecting movement of said blade with respect to said anvil thread supporting surface so that said blade razor edge comes in contact with said thread supporting surface, severing any thread supported thereon;

means for mounting said anvil so that its position with respect to said cutting blade may be varied, said mounting means comprising an elongated slot formed in a portion of said anvil, and a threaded fastener extending through said slot and positioned and dimensioned so that when it is tightened down to a supporting surface the anvil is held in place with respect to the supporting surface, and when it is not tightened down the anvil is movable with respect to the supporting surface, with the fastener sliding within said elongated slot; and



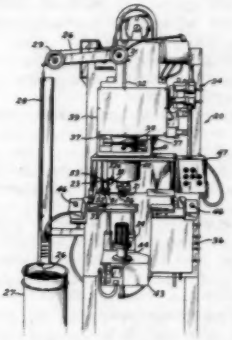
wherein said anvil block thread supporting surface is mounted on a portion of said anvil generally perpendicular to said anvil portion having said elongated slot.

4,387,745

APPARATUS AND METHODS FOR HANDLING AND CONTROLLING WIRE IN WINDING APPLICATIONS

Ronald H. Brown, Hamilton, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 114,880, Jan. 24, 1980, abandoned. This application Oct. 27, 1980, Ser. No. 201,220
Int. Cl.³ B21F *3/00*
U.S. Cl. 140—92.1 **3 Claims**



1. In a dynamoelectric machine coil winding machine, of the type having a flyer arm rotatable about a stationary, multi-sized turn position coil form, the improvement comprising: a wire tensioning device mounted for rotation with the flyer arm and being in contact with the wire, between the flyer arm and the form to create a preselected degree of tension on the wire as it is being wound on the form, the tension being established after the wire exits the flyer arm and being sufficient to stabilize the wire to avoid inadvertent jumping of the wire to an undesired turn form position during the coil forming process and wherein the tensioning device comprises U-shaped bracket having parallel arms straddling the wire as it exits the flyer arm; at least one fixed wire bearing surface spanning the parallel arms at the open end of the bracket; a movable pressure block channelled between the parallel arms and having at least another wire bearing surface on the opposite side of the wire from said one surface; and means for applying a force to the

pressure block in a direction to bring said surfaces into contact with said wire with a magnitude sufficient to create said preselected degree of tension in the wire during the winding process.

4,387,746

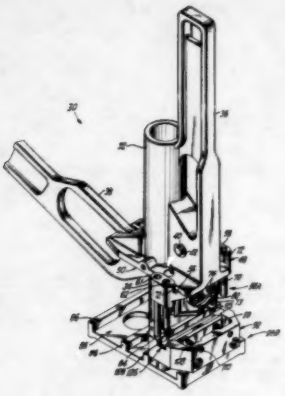
WIRE SEPARATION TOOL AND METHOD OF PREPARING MULTICONDUCTOR CABLE

James E. Meehan, Levittown, N.Y., assignor to Slater Electric Inc., Glen Cove, N.Y.

Filed Mar. 14, 1980, Ser. No. 130,223

Int. Cl.³ B21F *1/00*; B26B *17/00*

U.S. Cl. 140—105 **22 Claims**



1. A method of preparing an insulated multi-conductor electrical cable for termination to a self-contained electrical wiring device, comprising the steps of:

moving the cable onto a pair of cutting blades to slice into the cable insulation, each blade slicing between individual conductors within the cable;

separating the individual conductors from each other by further advancing the cable onto spreader means in association with said blades to spread apart the sliced cable conductors, said steps of advancing the cable and separating the conductors being carried out generally simultaneously by a single tool member by closing a pair of pivotally connected handle members one of which directly causes advancement of the cable by vehicle fulcrum means adapted to enable application of a generally uniform force to said tool during said advancing and separating steps; and

supporting each cable conductor during said separating step.

4. A tool for slicing through the insulating sheath on a multi-conductor electrical cable and spreading apart the cable conductors, comprising:

an anvil assembly having cutting blade means thereon for slicing the cable sheath and spreader means adapted to spread conductors of the cable after the sheath is sliced;

a cable advance assembly adapted to locate the cable prior to slicing and to support the conductors in generally the same plane as the cable while the cable sheath is being sliced and the conductors are being separated; and

tool frame means operatively coupling said cable-advance and anvil assemblies, said tool frame means including a pair of handle members operable in generally scissor-like manner to move said cable-advance assembly towards said anvil assembly when said handle members are urged towards each other, one of said handle members of said tool frame means being operably coupled to said cable-advance assembly by variable fulcrum means adapted to achieve maximum mechanical advantage at a point of closure of said handle members towards each other corresponding to maximum resistance to slicing the cable, such that operation of the tool requires exertion of a generally uniform force during slicing of the sheath and spreading of the conductors.

4,387,747

FILLING OF CONTAINERS

Josef T. Franek, Chorleywood; Paul Porucznik, St. Albans, and Alan E. Styles, Wantage, all of England, assignors to Metal Box Limited, Reading, England

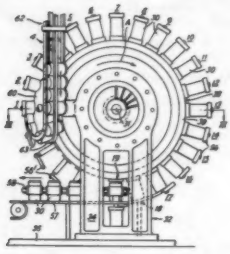
PCT No. PCT/GB80/00140, § 371 Date Jun. 17, 1981, § 102(e) Date Jun. 17, 1981, PCT Pub. No. WO81/01138, PCT Pub. Date Apr. 30, 1981

PCT Filed Sep. 10, 1980, Ser. No. 276,360

Claims priority, application United Kingdom, Oct. 27, 1979, 7937323

Int. Cl.³ B65B *3/04*, *1/14*

U.S. Cl. 141—1 **11 Claims**



1. A method of filling a succession of substantially identical containers (30) with a flowable product, in which: (a) whilst each container is being rotated non-intermittently along a circumferential path (1–19) about a horizontal axis of rotation (31), the container being at the same time held with its axis (44) radial with respect to said path and with its open end facing radially inwards, the product is introduced into the container through said open end radially outwardly via a filling valve (43) rotating therewith, and (b) each filled container in succession is transferred, at a release position (19) in which its open end is generally uppermost, from the circumferential path to a linear path (57) tangential thereto, characterised in that: (c) flowable product is led to each filling valve in a generally radially outward direction; (d) the containers are rotated at a velocity such that, over the whole of an arc of the circumferential path followed by each container as it receives said product, a resultant force on said product due to centrifugal and gravitational accelerations of the product itself is always in a direction generally toward the closed end of the container, the product being caused to flow through the filling valve into the container by said resultant force (with or without the assistance of internal pressurization of the product) and the resultant force alone retaining the product in the container with a free surface perpendicular to the direction of said force; and (e) each filled container is transferred to said linear path with substantially no change in its linear velocity.

4,387,748

CAN FILLING NOZZLE HEAD

Hugh L. White, Rte. 3, Box 51, Warrenton, Mo. 63383

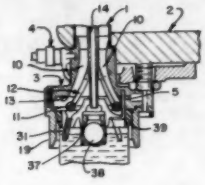
Filed Oct. 29, 1981, Ser. No. 316,218

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—57 **10 Claims**

1. In a high production can filling machine nozzle head, the improvement comprising an annular nose, adapted to extend within a can to be filled, said nose having a leading surface with an exterior, peripheral chamfer convergent in a direction

toward a can to be filled, a multiplicity of liquid passages extending through the nose and opening at one end through



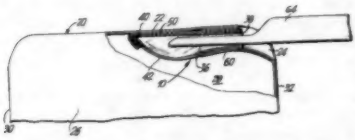
said chamfered surface area of said leading surface, and communicating at another end with the interior of a filler bowl, and means for permitting snifting of the head space of said can.

4,387,749

FILLER SLEEVE FOR USE IN CONJUNCTION WITH A BAG ADAPTED TO CONTAIN A GRANULAR PRODUCT

Frederick A. Donisi, Trenton, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 8, 1981, Ser. No. 300,038
Int. Cl.³ B65B *1/04*
U.S. Cl. 141—68 **14 Claims**



10. A filler sleeve for use in conjunction with a bag adapted to contain a granular-type product, said bag having an elongated tubular configuration including top and bottom ends, with the bottom end of said bag being closed and with the top end thereof including a filler opening, said filler sleeve comprising:

and elongated tubular member formed from a stretchable material, said tubular member being disposed within said bag and connected to the top end thereof, said tubular member having an open end contiguous with said filler opening in said top end of said bag, and with the opposed end of said tubular member being closed, said tubular member further including a longitudinally extending slit running from said closed end of said tubular member to a point intermediate the length thereof, said slit being disposed on the bottom surface of said tubular member opposed to the top end of said bag, whereby when said bag is filled by introducing said products, through said filler opening into said tubular member under pressure, said tubular member stretches, and simultaneously permits the deflection of the product downwardly into said bag through said slit, and wherein when the filling of said bag is completed, the bag may be inverted such that the portions of said tubular member defining said slit overlap and the weight of said product on said tubular member functions to securely close said slit thereby preventing unwanted escape of said product from said bag.

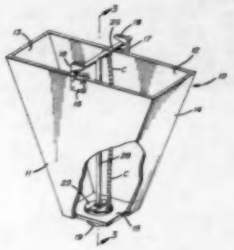
4,387,750

SEWER CLEAN OUT DEVICE

Robert McNerney, P.O. Box 166, Sharpsville, Pa. 16150

Filed Oct. 22, 1981, Ser. No. 313,968
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—331 **5 Claims**

1. A clean out device for communication with a sewer pipe opening in a sewer line comprising a storage tank, a sleeve in communication with said storage tank and said sewer pipe opening, said sleeve having an inner diameter equal to that of said sewer line so that a large volume of liquid inside said tank can flow through said sleeve, a valve stopper engaging said sleeve, said valve stopper formed of resilient material, a rubber body secured to said valve stopper, means for holding said valve stopper against said sleeve arranged to distort said valve



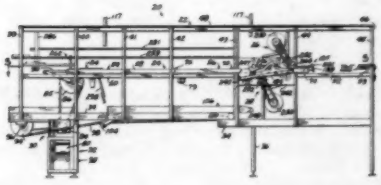
stopper and rubber body, fasteners secured to said storage tank for engagement with said holding means, means for sealing said sleeve in an opening in a sewer line to be cleared, means for moving said valve stopper from said sleeve.

4,387,751

AUTOMATIC FENCE PICKET POINTING MACHINE

Charles P. Carter, 301 SW. 46, Oklahoma City, Okla. 73109

Filed Mar. 3, 1981, Ser. No. 239,965
Int. Cl.³ B27M *3/00*
U.S. Cl. 144—30 **9 Claims**



1. An automatic picket pointing machine, comprising:

an elongated upright open frame having spaced-apart sides defining a vertical workpiece passage path intermediate its ends and open toward one end of the frame for receiving horizontally disposed workpieces from a supply conveyor;

carriage means having opposite end portions intersecting the vertical workpiece path and horizontally reciprocable between the ends of said frame;

drive means operatively connected with said carriage for reciprocating the latter;

retractable carriage movement operated shelf means projecting inwardly from one said frame side for horizontally supporting an elongated workpiece in the plane of said carriage;

rotary cutter means supported by said frame above and below the carriage travel path;

workpiece clamp means supported by said carriage for gripping opposing lateral sides of and moving the workpiece with said carriage;

clamp opening and closing means for closing said clamp means in response to carriage movement in one direction and for opening said clamp means in response to carriage movement in the opposite direction;

cam means cooperating with said clamp means for sequentially moving opposing edge surfaces of one end portion of the workpiece into contact with said rotary cutter means; and,

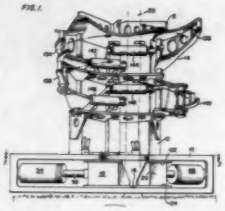
discharge conveyor means for moving the workpiece out of said frame.

4,387,752

TREE SHEARING APPARATUS

Robert C. Tyer, Baldwin, Fla., assignor to Rockland Manufacturing Co., Inc., Bedford, Pa.

Filed Aug. 27, 1981, Ser. No. 296,576
Int. Cl.³ A01G 23/08
U.S. Cl. 144—34 E 28 Claims



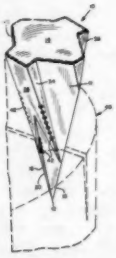
1. A tree shearing apparatus comprising a main frame mountable on support arms of a machine, a pair of pivot pins mounted on said main frame, a blade support arm mounted on each of said pivot pins for pivotal movement about the axis of said pivot pin, a cutting blade having a leading cutting edges mounted on each of said blade support arms, means mounted on said main frame for pivoting said blade support arms for moving said leading cutting edges toward and away from each other, causing said leading cutting edges to sever a tree trunk or the like positioned therebetween, and means mounted on said main frame and operatively connected to at least one of said pivot pins for adjusting the attitude of said pivot pin and correspondingly adjusting the interrelationship of the positions of said leading cutting edges of said blades.

4,387,753

SPLITTING DEVICE WITH VARYING CROSS SECTIONS

Michael J. Reynolds, Gladstone, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed May 1, 1981, Ser. No. 259,535
Int. Cl.³ B27L 7/00
U.S. Cl. 144—193 D 20 Claims



2. An elongate unitary splitting device comprising

a substantially pointed first end,

a lower portion adjacent and extending upwardly from said first end, said lower portion being multiangular with a plurality of edges, at least a pair of opposed edges thereof diverging from each other at a first angle on progressing upwardly from said first end, and

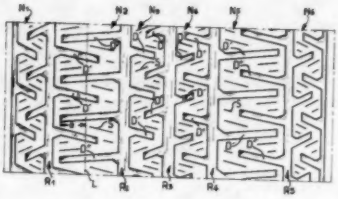
an upper portion having a pair of generally planar, oppositely facing side surfaces, said side surfaces being intersected intermediate the ends of said device by said opposed edges, with said side surfaces diverging on progressing upwardly from the region of intersection at a second angle at least as great as said first angle, a side surface being bordered by a pair of substantially parallel, oppositely facing side margins extending longitudinally of said device.

4,387,754

TIRE TREAD PATTERN

Henri J. Mirtain, Compiegne, France, and Norbert Zinnen, Aachen, Fed. Rep. of Germany, assignors to Pneu Uniroyal Englebert, Clairoix, France and Uniroyal Englebert Reifen GmbH, Aachen, Fed. Rep. of Germany, a part interest

Filed May 19, 1980, Ser. No. 151,463
Claims priority, application France, Aug. 20, 1979, 79 21013
Int. Cl.³ B60C 11/00
U.S. Cl. 152—209 R 7 Claims



1. A tire tread pattern, which comprises in combination:

a plurality of circumferential ribs spaced from one another with each rib extending laterally from a circumferential center line of the tire, each rib further having a fixed maximum width defined by two adjacent parallel circumferential lines, each of which lines lies completely within a single plane extending radially with respect to the tire and within which lines the lateral extent of the rib is confined; the parallel circumferential lines within which each rib is confined opposing the adjacent parallel circumferential lines defining the respective adjacent rib edge, to further define between the ribs a plurality of substantially rectilinear, circumferential grooves of substantially constant width; the grooves being free of any portions of said ribs in the area between the circumferential parallel lines defining the grooves;

laterally extending notches distributed around the circumference of each rib and each notch center line being inclined with respect to the circumferential center line and axial width of each rib;

each rib having two groups of notches with one group along each edge of the rib, and the notches of each group extending inwardly from their respective rib edge toward the interior of the rib a predetermined distance beyond the center line of the rib;

the notches in a given rib and the notches in an adjacent rib edge which open into a common groove being shifted in the circumferential direction, wherein the notches of said given rib open into said common groove at a different location than the notches of the adjacent rib, when viewed in the circumferential direction; the location of each notch in the given rib being displaced from half the distance between two adjacent notches in the adjacent rib; and

the notches of one group of notches of a given rib extending in a first direction with respect to the circumferential direction, and the other notches of the given rib extending in a second direction opposite to the first direction.

4,387,755

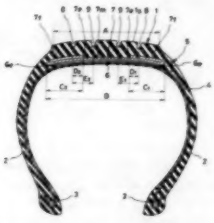
PNEUMATIC TIRES

Masaki Kato, Isehara; Tuneo Morikawa, and Kazuyuki Kabe, both of Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 220,913
Claims priority, application Japan, Dec. 28, 1979, 54-170396
Int. Cl.³ B60C 11/00, 9/00
U.S. Cl. 152—209 R 4 Claims

1. A pneumatic tire with improved durability comprising: a tread having a surface including from 3 to 5 circumferential grooves and a tread surface width, a distance between the

center of the outermost circumferential groove and the center of an adjacent circumferential groove being greater than 15% of said tread surface width; a radial carcass under said tread having cords arranged at an angle of 75° to 90° to a circumferential direction of the tire; and a reinforcement layer disposed between said tread and said carcass; said reinforcement layer consisting of a single steel cord strip layer adjacent said carcass and a single aromatic polyamide cord strip layer adjacent the tread surface, exhibiting substantially no thermal shrinkage and the polyamide cords having a tensile strength of at least 10 g/d and a Young's modulus of at least 1500 kg/mm^2, said steel cord strip layer and said aromatic polyamide cord strip layer being superposed one on the other in a parallel side-by-side relationship to each other, said aromatic polyamide cord strip layer



being folded at its both edges toward the center such that the folded portions contact the central main portion in a parallel side-by-side relationship, said main portion having a width falling between 100 and 110% of said tread surface width, each of said folded portions having a width falling between 30.0 and 32.5% of the width of said main portion; the free edge of each folded portion being positioned at a free-edge distance from the center of the outermost circumferential groove in said tread surface, said free-edge distance amounting to 25 to 75% of said distance between the center of said outermost circumferential groove and the adjacent circumferential groove, said single steel cord strip layer being unfolded and having a width smaller than the width of said main portion of said aromatic polyamide cord strip layer.

4,387,756

PNEUMATIC TIRES

Masaki Ogawa, Sayama, and Mikihiko Ikegami, Tokorozawa, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,536

Claims priority, application Japan, Sep. 10, 1980, 55-124662

Int. Cl.^{3} B60C *11/00, 1/00*

U.S. Cl. 152—209 R **3 Claims**

1. A pneumatic tire having a tread, which comprises using in said tread a rubber composition comprising

(1) a styrene-butadiene copolymer rubber as defined below alone or a blend rubber of not less than 30 parts by wt. of said styrene-butadiene copolymer rubber and not more than 70 parts by wt. of a diene rubber, and containing

(2) 10 to 120 parts by wt. of carbon black based on 100 parts by wt. of said styrene-butadiene copolymer rubber or said blend rubber, and

(3) 0.5 to 5 parts by wt. of a vulcanizer based on 100 parts by wt. of said styrene-butadiene copolymer rubber or said blend rubber,

said styrene-butadiene copolymer rubber being obtained by random copolymerization of styrene with 1,3-butadiene and satisfying the following requirements:

(a) the content of bound styrene is 12 to 35% by weight;

(b) the content of 1,2-bond in the butadiene portion is 30 to 40% by weight,

(c) the content of trans-1,4 bond in the butadiene portion is not less than 42% by weight;

(d) the value obtained by subtracting the content of cis-1,4 bond in the butadiene portion from said content of trans-1,4 bond is not less than 8% by weight;

(e) the relation between said content of bound styrene and said content of 1,2-bond is $65 \leqq 1.7$ times the content of bound styrene in % by weight plus the content of 1,2-bond in % by weight $\leqq 100$; and

(f) the ratio of weight mean molecular weight ($\bar{M}_w$) to number mean molecular weight ($\bar{M}_n$) is not more than 2.3.

4,387,757

PNEUMATIC TIRES

Masaki Ogawa, Sayama, and Mikihiko Ikegami, Tokorozawa, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sep. 16, 1981, Ser. No. 302,937

Claims priority, application Japan, Sep. 20, 1980, 55-130077

Int. Cl.^{3} B60C *11/00, 1/00*

U.S. Cl. 152—209 R **3 Claims**

1. A pneumatic tire having a tread, which comprises using in said tread a rubber composition containing 10 to 120 parts by weight of carbon black and 0.5 to 5 parts by weight of a vulcanizer based on 100 parts by weight of a novel styrene-butadiene copolymer rubber as defined below alone or a blend rubber of not less than 30 parts by weight of said copolymer rubber and not more than 70 parts by weight of another diene rubber, said styrene-butadiene copolymer rubber being obtained by random copolymerization of styrene with 1,3-butadiene and satisfying the following requirements:

(1) a content of bound styrene is 10 to 30% by weight;

(2) a content of 1,2-bond in butadiene portion is 42 to 70% by weight;

(3) a content of trans-1,4 bond in butadiene portion is not less than 25% by weight;

(4) a value obtained by subtracting a content of cis-1,4 bond in butadiene portion from said content of trans-1,4 bond is not less than 8% by weight;

(5) a relation between said content of bound styrene and said content of 1,2-bond is $65 \leqq 1.7 \times$ the content of bound styrene (% by weight) + the content of 1,2-bond (% by weight) $\leqq 100$;

(6) a weight mean molecular weight ($\bar{M}_w$) is 35×10^4 to 65×10^4;

(7) a ratio of weight mean molecular weight ($\bar{M}_w$) to number mean molecular weight ($\bar{M}_n$) is not more than 2.3;

(8) the number of peaks in molecular weight distribution curve is not less than 2; and

(9) a relation between said weight mean molecular weight and said content of trans-1,4 bond is $75 \leqq \bar{M}_w \times 10^{-4} + 1.3 \times$ the content of trans-1,4 bond (% by weight) $\leqq 120$.

4,387,758

HEAVY DUTY PNEUMATIC LOW-SECTIONAL RADIAL TIRE

Hideki Matsuda, Higashimurayama; Shigeo Makino, Tokorozawa, and Noboru Sugimura, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 26, 1981, Ser. No. 296,408

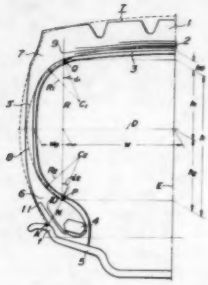
Claims priority, application Japan, Sep. 5, 1980, 55-123231

Int. Cl.^{3} B60C *3/00, 9/08*

U.S. Cl. 152—353 R **5 Claims**

1. In a heavy duty pneumatic low-sectional radial tire having an aspect ratio of $H/S \leqq 0.8$ where H is a tire height and S is a maximum tire width and comprising a pair of bead portions, a pair of side portions, a tread portion extending across said side portions, and a reinforcement for a tire casing composed of at least one carcass ply extending across two bead cores embedded in said bead portions and turning up around said bead core and containing cords embedded therein in a substantially radial direction of the tire, each cord having a modulus of not less than 4,000 kg/mm^2, and a belt of at least two layers, each layer

containing metal cords embedded therein, superimposed around a crown portion of said carcass and crossing with each other at a relatively small angle with respect to the equatorial line of the tire, the improvement wherein a carcass line of said tire casing at a temporarily mounted posture of the tire on a normal rim under an internal pressure of 0.5 kg/cm^2 depicts a bow-shaped profile in tire section defined by a curved line, whose curvature being smaller with distance from a chord $\overline{PQ}$ at the outside of the chord $\overline{PQ}$, where the chord $\overline{PQ}$ is a line segment connecting a point P to a point Q, the point P is an intersection of said carcass line and a normal line of said carcass line passing an alienating point of said bead portion from a rim flange or an inflection point of said carcass line when said intersection is located inside said inflection point and the point



Q is an intersection of said carcass line and a radial line of the tire passing said point P; said bow-shaped profile is substantially symmetrical with respect to a substantially perpendicular bisector of said chord $\overline{PQ}$ as a symmetrical axis inside and outside thereof; and a distance w_0 between said chord $\overline{PQ}$ and said carcass line as measured along said perpendicular bisector is 0.25–0.35 times a distance w between the chord $\overline{PQ}$ and an equatorial plane of the tire, whereby deformations at the vicinity of side edges of said belt as well as the turnup end of said carcass and upper end of bead reinforcing layer, which may be arranged along the turnup portion of said carcass, when the width of the tire is enlarged by inflation with a normal internal pressure, are minute as compared with the deformation produced at said side portion.

4,387,759

PNEUMATIC RADIAL TIRE

Kazuo Obata; Yutaka Yamaguchi; Kojirou Yamaguchi, and Akio Sato, all of Higashimurayama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

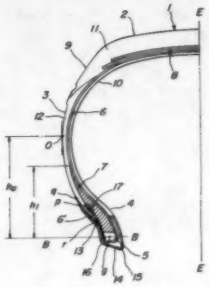
Filed Oct. 5, 1981, Ser. No. 308,644

Claims priority, application Japan, Oct. 16, 1980, 55-143687

Int. Cl.^{3} B60C *15/06, 9/08*

U.S. Cl. 152—353 R **2 Claims**

1. A pneumatic radial tire for passenger cars comprising; a cylindrical tread portion, side portions located at both sides of the tread portion and extending inwardly in the radial direction, bead portions located at radially inner edge portions of the side portions and having a bead wire; said tread, side and bead portions being reinforced with a carcass comprising at least one radially arranged fiber cord layer and turned up around the bead wire from the inside to the outside; the turn-up end of the carcass being substantially terminated in the bead portion; said bead portion being reinforced by arranging a tapered hard rubber filler having a Shore A hardness of 75°–97° between the carcass and the turn-up portion thereof to extend from the upper portion of the bead wire towards the side portion beyond the turn-up end of the carcass; a soft side rubber having a Shore A hardness of 30°–60° located on each outer side of the carcass adjacent thereto and extending from the side portion to a position beyond the end of the turn-up portion of the carcass in the bead portion, and a hard rubber chafer having a Shore A hardness of 60°–80° located on a surface of each bead which at least contacts a rim flange when the tire is mounted on a rim, the upper end of said hard rubber chafer extending towards the side portion to a position beyond the end of the turn-up portion of the carcass, the radially



innermost portion of said soft side rubber directly sandwiched between and in contact with the upper portion of said rubber chafer and said turn-up portion of the carcass and the end of the turn-up portion of the carcass sandwiched directly between and in contact with said soft side rubber and said hard rubber filler.

4,387,760

SLIDING FOLDING DOOR

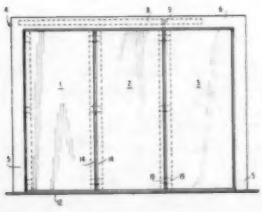
Manfred Greschbach, Eisenbahnstrasse 44, D-7834 Herbolzheim, Fed. Rep. of Germany

Filed Feb. 1, 1980, Ser. No. 117,624

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1979, 2903745

Int. Cl.^{3} E06B *3/48*

U.S. Cl. 160—229 R **13 Claims**



1. A sliding folding door comprising a plurality of door leaves, each of said door leaves being of a double-walled construction and including inner and outer walls, shaped connecting rail means connecting adjacent door leaves to each other by way of vertically extending pivot means disposed in the connecting rail means, said pivot means enabling the respective leaves to be pivotable relative to one another about two laterally spaced vertical pivot shafts, wherein each connecting rail means includes a pair of laterally spaced cylindrical first walls which are nonrotatably connected to said connecting rail means, each of the cylindrical first walls having an arcuate length of approximately a quarter-circle and a radius of curvature having a center point arranged in the pivot means, and in that a pair of first crosspieces are connected to and extend along a long side of the respective leaves of the door from one of said inner and outer walls, one of said first crosspieces is disposed opposite one of the first cylindrical walls in close spaced relationship and the other of the first crosspieces is disposed opposite the other of the first cylindrical walls in

close spaced relationship so that any gaps between the pivot means and the adjacent door leaves remain small in any position of pivoting of the door leaves whereby there is an excellent seal as well as avoidance of risk of accidental injury.

4,387,761

NOZZLE FOR ROTARY CONTINUOUS CASTER

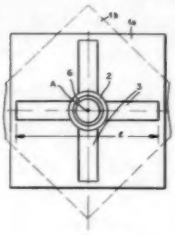
Paul Metz, Brasseur, Luxembourg, assignor to Arbed S.A., Luxembourg, Luxembourg

Filed Dec. 15, 1980, Ser. No. 216,539

Claims priority, application Luxembourg, Dec. 17, 1979, 82001

Int. Cl.³ B22D *11/10*

U.S. Cl. 164—437 **9 Claims**



1. In a continuous-casting system wherein molten metal is introduced downward into a mold through a nozzle opening downward into said mold at an axis to form in said mold a body of said molten metal having an upper surface carrying impurities above the mouth of said nozzle, and wherein said body of molten metal is rotated about said axis in said mold, the improvement wherein said nozzle is provided generally at the level of said upper surface of said body with radially outwardly projecting vanes that prevent said body from rotating about said axis at said upper surface, the vanes each having a horizontal upper edge and a concave lower edge.

4,387,762

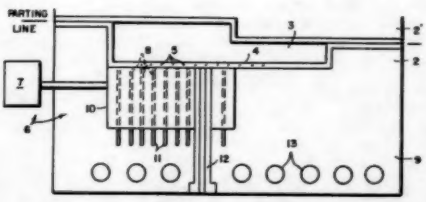
CONTROLLABLE HEAT TRANSFER DEVICE

James R. Rinderle, Watertown, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 22, 1980, Ser. No. 152,382

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—1 **2 Claims**



1. A method of controlling the thermal conductance of a heat pipe which includes a sealed chamber having an evaporator portion to which heat to be conducted is supplied, fluid contained within said sealed chamber, and wicking means within said sealed chamber for transporting the liquid phase of said fluid to said evaporator portion, said method comprising controllably changing the total volume of said sealed chamber so that the volume within said chamber available for holding said fluid in the evaporated phase, and thus correspondingly the portion of the fluid in said chamber in the evaporated phase, as opposed to the liquid phase, changes sufficiently to vary said heat pipe between a condition in which said wicking means supplies fluid in said liquid phase to said evaporator portion and a condition in which a lack of said fluid in said liquid phase causes said wicking means to substantially cease supplying said fluid in said liquid phas4 to said evaporator portion.

4,387,763

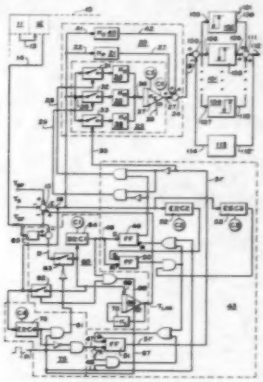
MULTISTAGE THERMOSTAT USING MULTIRATE INTEGRAL ACTION AND EXPONENTIAL SETPOINT CHANGE

Ronald Benton, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 14, 1981, Ser. No. 301,679

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—29 **19 Claims**



2. Multistage thermostat means adapted to operate a heating plant having primary heating means and secondary heating means, including: temperature sensing means having an output signal responsive to an ambient temperature to be controlled by the operation of said heating plant; variable temperature setpoint means having an output signal to set said thermostat means to control said ambient temperature by the operation of said heating plant; temperature setup and setback means to generate a temperature offset signal; clock means to provide a continuous series of timed intervals; fist summing means having inputs connected to receive said sensing means signal, said temperature offset signal, and to receive said setpoint means signal with said summing means including output means having a signal representative of a current temperature error; previous offset temperature means connected to said offset signal and having a new output signal equal to said offset signal at an interval of time prior to a current interval of time; signal processing means including at least a proportional constant signal processing channel, and an integrating signal processing channel connected in parallel to said first summing means and to a second summing means with said second summing means having an output providing a continuous composite error signal; said integrating signal processing channel including a plurality of gain constants selectively connected to integrator means to provide said integrating signal processing channel with a selectable gain constant; integrator gain control logic means having comparator means and switching means with input means of said integrator gain control logic means connected to respond to said current temperature error and having output means connected to said integrating signal processing channel to operate switch means to select a gain constant for said integrating signal processing channel; exponential decay bias means with said exponential decay bias means having

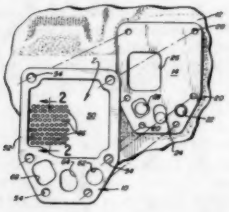
input means including said previous offset temperature means connected to said temperature offset signal, and to said current temperature error signal to cause said exponential decay bias means to generate an exponentially decaying output signal; said exponentially decaying output signal being connected to said first summing means to alter said current temperature error signal when said exponentially decaying output signal is generated; and multistage cycler means having input and output means; said multistage cycler input means connected to receive said continuous composite error signal; said cycler output means adapted to be connected to said heating plant and having a staged output signal responsive to said continuous composite error signal from said signal processing means to progressively stage said primary heating means and said secondary heating means of said heating plant.

4,387,764

GASKET SCREENING ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE HAVING AN AUXILIARY OIL COOLER

Marc D. Lister, Wilmette, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed Dec. 3, 1981, Ser. No. 327,259
Int. Cl.³ F28F 19/00; B01D 29/04
U.S. Cl. 165—119 6 Claims



4. Means sealing an internal combustion engine block to an associated oil cooler assembly for screening particles from the coolant passing through the oil cooler comprising

a screening gasket assembly having an expansive metallic core having a pair of major surfaces, a compressible facing layer secured to each major surface of said core about the periphery of each said major surface thereby to surround a central core zone of each major surface, a first clear-through opening for coolant, a second clear-through oil exit, and a third clear-through oil inlet, each in the zones of said facing layers for providing flow-paths between said engine block and said oil cooler, said central core zone defining a multiplicity of closely adjacent, substantially circular perforations for providing a fourth, water inlet path through said central core zone in said gasket screening assembly between said engine block and said oil cooler,

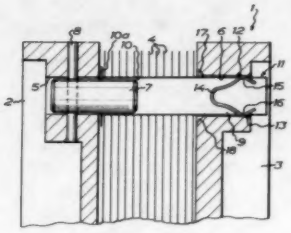
flanges defined by each of said engine block and oil cooler assembly for clampingly and sealingly gripping said screening gasket assembly, and each said flange defining bores in line with and in flow communication with said first through fourth openings, whereby particles in water passing through said multiplicity of perforations are adapted to be screened from liquid passing through said multiplicity of perforations against return through said first clear-through coolant opening.

4,387,765

ARRANGEMENT FOR LOCATING THE PLATES INCLUDED IN A PLATE HEAT EXCHANGER

Ingmar Kristoffersson, Rönninge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Dec. 21, 1981, Ser. No. 332,877
Claims priority, application Sweden, Dec. 22, 1980, 8009081
Int. Cl.³ F28F 3/08
U.S. Cl. 165—166 7 Claims



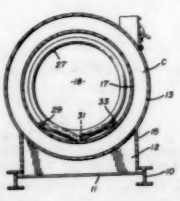
1. Arrangement in heat exchangers, comprising a large number of heat exchange plates (14) which, in compressed position, form throughflow passages for the heat exchange media, a first preferably stationary end wall (2) situated on one side of the heat exchange plates (4) and a second end wall (3) situated on the opposite side of said plates and adapted to be displaced by clamping means towards said first end wall in order to sealingly compress the heat exchange plates, said preferably stationary end wall (2) supporting a bar (10) projecting therefrom and extending through recesses arranged in the heat exchange plates in order to locate said plates mutually and relative to the end walls against displacement in the plane of the plates when the clamping means are disconnected and/or the second end wall is removed, said bar having a length exceeding the distance between the end walls in the position where they compress the plates, wherein the bar (9), which is detachably fitted to the first end wall (2), has close to said wall a stationary abutment (10) serving as an end stop for the plates in one direction and at its opposite end wall a means (15, 16) being withdrawable against spring action and serving as an end stop, said means being spaced from said first abutment (10) at a distance exceeding the total thickness of the heat exchange plates.

4,387,766

HOT OIL HEATER WITH HELICAL COIL BAFFLE

John H. Miller, Youngstown, Ohio, assignor to Hy-Way Heat Systems, Inc., Youngstown, Ohio

Division of Ser. No. 89,255, Oct. 29, 1979, Pat. No. 4,299,194.
This application Jan. 21, 1981, Ser. No. 226,893
Int. Cl.³ F28D 7/02; F28F 9/00
U.S. Cl. 165—172 5 Claims



1. A horizontally disposed cylindrical shaped baffle for use in a heater and the like in which liquids are heated, said baffle comprising a single helical coil of tubing, the convolutions of

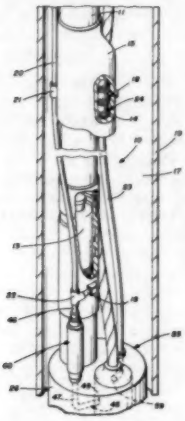
which are vertically arranged in side by side engaging relation and having straight sections of tubing communicating with said helical coil of tubing at the opposite ends thereof and extending in spaced parallel relation to one another on the outer side of and in supporting relation to said engaging convolutions of tubing forming said helical coil.

4,387,767

SUBSURFACE SAFETY VALVE SYSTEM WITH HYDRAULIC PACKER

Norman W. Read, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 13, 1980, Ser. No. 206,595
Int. Cl.³ E21B *33/122*
U.S. Cl. 166—72 **15 Claims**



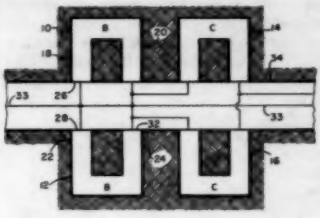
1. A well production apparatus for fluid production through safety valve means acting both in well tubing and the annulus between the tubing and casing in a well, said apparatus including a packer with a head connected to the lower end of the tubing and having dual bores extending therethrough for communicating separately with the tubing and the annulus, primary and secondary packer mandrels communicating with said bores and depending from connections with said head, said primary packer mandrel serving as a conduit for directing production fluid to the safety valve means and said secondary packer mandrel serving as a second conduit through which a power conductor extends for connecting with a motor beneath said packer, a set of hydraulically movable slips slidable between retracted and deployed positions, a packing element surrounding said primary and secondary mandrels beneath said head, a setting cylinder secured to one of said packer mandrels and defining a pressure chamber, a setting piston movable on one of said packer mandrels within said pressure chamber from a retracted position to an extended position to compress said packing element and deploy said slips for anchoring said packer in the casing, and a control pressure passage extension with one end connecting to said pressure chamber exteriorly of said primary packer mandrel and an opposite end for connection to a control pressure line leading to the safety valve means, said passage extension serving to deliver pressure fluid to said chamber to set said slips when installing the apparatus in the well.

4,387,768

MODIFIED IN SITU RETORTING OF OIL SHALE

John J. Reagan, Parma, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 13, 1981, Ser. No. 253,987
Int. Cl.³ E21B *43/243, 43/263*
U.S. Cl. 166—256 **8 Claims**



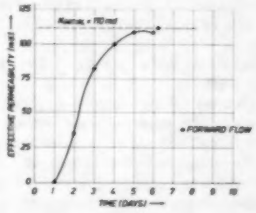
1. In a process for the in situ recovery of shale oil from an oil shale formation in which a first gas is charged into a rubblized bed in said formation and a second gas is removed from said bed, the improvement wherein said bed is U-shaped and defines an inlet leg and an outlet leg, said inlet and outlet legs communicating with a common channel in said formation.

4,387,769

METHOD FOR REDUCING THE PERMEABILITY OF SUBTERRANEAN FORMATIONS

Steven R. Erbstoesser, Missouri City; Claude E. Cooke, Jr., Houston, both of Tex.; Richard G. Sinclair, and Michael M. Epstein, both of Columbus, Ohio, assignors to Exxon Production Research Co., Houston, Tex.

Filed Aug. 10, 1981, Ser. No. 291,200
Int. Cl.³ E21B *33/138, 43/22*
U.S. Cl. 166—295 **11 Claims**



1. A method for reducing the permeability of a subterranean formation penetrated by a wellbore comprising:

dispersing discrete solid structures comprising a polyester polymer into a wellbore fluid, said polymer being substantially insoluble in said wellbore fluid and degradable in the presence of water at the formation temperature to oligomers which are at least partially soluble in a formation fluid and

placing said wellbore fluid containing said structures dispersed therein into said wellbore.

10. A method for reducing the permeability of a subterranean formation penetrated by a wellbore comprising:

dispersing discrete solid structures comprising a polyester polymer into a wellbore fluid, said polymer being substantially insoluble in said wellbore fluid and degradable in the presence of water at an elevated temperature to oligomers which are at least partially soluble in a formation fluid,

placing said wellbore fluid containing said structures dispersed therein into said wellbore, and

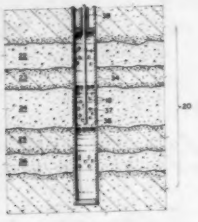
placing a hot fluid into said wellbore to raise the temperature of said formation to said elevated temperature.

4,387,770

PROCESS FOR SELECTIVE INJECTION INTO A SUBTERRANEAN FORMATION

Alfred D. Hill, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Nov. 12, 1980, Ser. No. 206,124
Int. Cl.³ E21B 43/16
U.S. Cl. 166—305 R **7 Claims**



1. A process for selectively injecting a fluid into a subterranean formation having at least one porous, hydrocarbon-containing zone vertically bounded by substantially impervious zones, said subterranean formation penetrated by a well bore which is in fluid communication with each of said at least one porous zone, wherein formation fluids which are immiscible with said injected fluid and which have a density substantially greater than the density of said injected fluid are initially present within said well bore, said process comprising:

creating at least one fluid interface between fluids having differing densities at a vertical location within said well bore adjacent one of the porous zones by injecting into said well bore a preflush fluid having a density substantially less than the density of said injected fluid, said preflush fluid being injected at a volume sufficient to establish a fluid interface with said formation fluids at a vertical location within said well bore adjacent to said one of the porous zones; and

injecting a fluid having a density intermediate the densities of said preflush fluid and said formation fluids into said well bore and into said one porous zone at a pressure less than the formation fracturing pressure, said injected fluid being vertically located within said well bore and injected into said one porous zone at said at least one fluid interface.

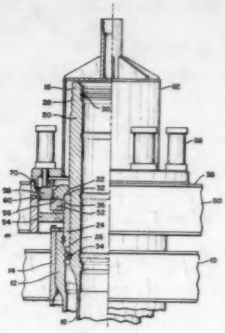
4,387,771

WELLHEAD SYSTEM FOR EXPLORATORY WELLS

Darrell L. Jones, 1991 Foster Ave., Ventura, Calif. 93001

PCT No. PCT/US80/01359, § 371 Date Feb. 17, 1981, § 102(e) Date Feb. 17, 1981
PCT Filed Oct. 14, 1980, Ser. No. 261,091
Int. Cl.³ E21B 33/035, 33/038, 43/01, 43/013
U.S. Cl. 166—341 **10 Claims**

1. A wellhead system for an exploratory subsea well adapted to accept accessory modules comprising: a wellhead housing; a generally cylindrical wellhead body supported and cemented within said housing, and extending above said housing; a first latch profile located on the outer periphery of said wellhead near the upper end for alternatively attaching a blowout preventer and production apparatus; a guide base attached to said wellhead housing; a plurality of vertical guide posts located on said guide base a preselected distance from said wellhead housing; a separate profile ring of larger diameter than said body; means for retaining said profile ring on a lower portion



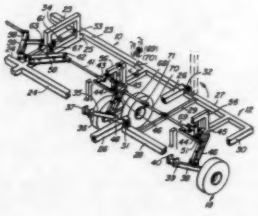
of said body; and a second latch profile located on said profile ring substantially below said first latch profile.

4,387,772

FARMING IMPLEMENT AND ELEVATION CONTROL THEREFOR

Joseph L. Bourgault, P.O. Box 202, Barbier Dr., St. Brieux, Saskatchewan, Canada (S0K 3V0)

Filed Sep. 14, 1981, Ser. No. 302,055
Claims priority, application Canada, May 25, 1981, 378252
Int. Cl.³ A01B 63/16, 73/00
U.S. Cl. 172—311 **10 Claims**



1. A farming implement of the type including a frame supported on ground wheel assemblies and having elevation control means for selectively raising or lowering the ground wheel assemblies relative to the frame in response to the actuation of drive means, to thus selectively adjust the spacing of the frame above the ground, each of said ground wheel assemblies being mounted at one end of a respective swing arm means, the other end of the swing arm means being pivotally secured to the frame for pivoting movement about a normally horizontal swing axis extending transversely of the frame, wherein said elevation control means includes:

(a) connection means operatively associated with said drive means for reciprocating movement generally transversely of said frame, said connection means being further associated with ground wheel lifting and lowering means to transmit the movement of the drive means to the wheel lifting and lowering means, said wheel lifting and lowering means including:

(b) two-arm dependent link means pivotally secured at one end to said connection means for relative movement about a normally generally horizontal first longitudinal axis, the other end of the two-arm link means being pivotally secured to said swing arm means for relative pivotal movement about a normally generally horizontal second longitudinal axis and about a generally horizontal second transverse axis;

(c) dependent strut link means whose one end is pivotally secured to the frame by way of a universal-type joint allowing the pivoting of the strut link means about a normally generally horizontal first joint axis extending longitudinally of the frame, and about a generally horizontal joint axis extending transversely of the frame, the other end of the strut link means being secured to said two-arm link means for relative pivotal movement about a generally horizontal and longitudinal intermediate axis;

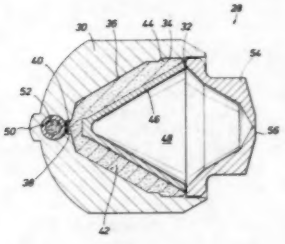
(d) the intermediate axis being equidistantly spaced from said longitudinal axes at the ends of the two-arm link means, and from said first joint axis; whereby a generally horizontal transverse movement of the connection means is transmitted to a raising or lowering movement of respective ground wheels relative to said frame.

4,387,773

SHAPED CHARGE WELL PERFORATOR

William A. McPhee, Jersey Village, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 13, 1981, Ser. No. 311,105
Int. Cl.³ E21B *43/117*
U.S. Cl. 175—4.6 **14 Claims**



1. An explosive shaped charge comprising:

a housing having a forwardly opening cavity formed therein, said cavity including a generally cylindrcial frontal portion having a channel formed therein, a tapered intermediate portion and a rearwardly located apex;

a charge of high explosive material within said cavity, the outer surface of said explosive material conforming to the inner surface of said cavity; and

a forwardly diverging conical liner having an apex in alignment with the apex of said cavity, said liner cooperatively arranged to retain said explosive material in said cavity.

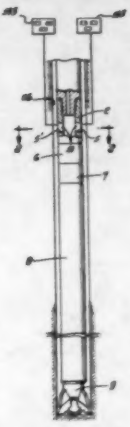
4,387,774

TIME RECORDER FOR IN-HOLE MOTORS

Roger P. Herbert, Lake Forest, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed May 4, 1981, Ser. No. 260,269
Int. Cl.³ E21B *45/00*
U.S. Cl. 175—40 **12 Claims**

1. In combination with an in-hole motor, means responsive to the circulation of fluid to said motor, said means comprising: a time recorder adjacent the entrance to the motor, a power source to activate the time recorder and a switch positioned



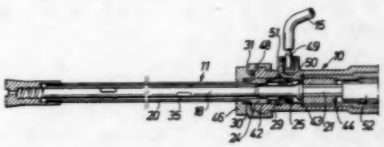
adjacent to said motor and electrically connected between said power source and said time recorder.

4,387,775

ROCK DRILLING APPARATUS

Ebbe S. Adolfsson, Handen; Kurt H. Andersson, Tyresö, and Carl G. B. Ekwall, Saltsjöbaden, all of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 24, 1981, Ser. No. 247,067
Claims priority, application Sweden, Apr. 3, 1980, 8002589
Int. Cl.³ E21B *17/00*; E21C *3/06, 7/08*
U.S. Cl. 175—135 **11 Claims**



1. Rock drilling apparatus comprising:

a pressure fluid driven rock drilling machine (10) having a percussive motor and a rotation chuck (44) arranged in a housing (43);

a drill rod (18) connectable to said housing (43) and having a drill bit (16) at one end of said drill rod (18) and a shank (21) at the other end of said drill rod (18), said drill bit (16) being spaced from said housing;

a tube (20) surrounding said drill rod (18) and extending from said drill bit (16) to said housing (43), said tube (20) having a rear adapter (24) nonrotatably attached to said tube (20);

the percussive action needed for the drilling being transmitted from said percussive motor to said drill bit (16) by said drill rod (18);

a collar (22) projecting from said drill rod (18) in front of said shank (21), said tube (20) extending between said collar (22) and said drill bit (16);

guiding means (33) on said drill bit (16) for maintaining said tube (20) rotatably between said drill bit (16) and said collar (22);

socket means (42) on said drilling machine (10) for receiving said rear adapter (24) therein with said rear adapter centered in a position radially spaced around said drill rod (18);

said shank (21) non-rotatably extending into said rotation chuck (44);

a disconnectable coupling device (46; 57) for maintaining said rear adapter (24) in said socket means (42); and

means (31; 55) for preventing relative rotation between said socket means (42) and said rear adapter (24) during operation of said percussive motor.

4,387,776

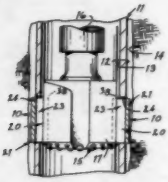
WELL CASE DRIVING ANVIL

Gerald L. Adcock, 2033 3rd Ave. North, Lewiston, Id. 83501

Filed Nov. 24, 1980, Ser. No. 209,652

Int. Cl.³ E21B 4/06, 7/20

U.S. Cl. 175—293 12 Claims



1. A well casing anvil device for attachment to a hollow well casing having cylindrical exterior and interior walls, mountable through a preformed aperture of a prescribed width through the walls for engagement by an axial impact device within the casing to drive the hollow well casing axially further into a well hole, said anvil device comprising:

a rigid anvil body;

said body having a mounting plate having a width greater than the width of the preformed aperture with a convex surface formed thereon to fit flush against the cylindrical exterior wall of the casing on opposite sides of the preformed aperture, covering the aperture;

said body having an anvil shoulder projecting outwardly from the mounting plate surface and adapted to extend through the casing aperture from the exterior wall and into the casing interior;

said anvil shoulder having an axially facing striking surface to be engaged within the casing by the impact device.

4,387,777

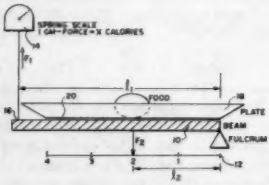
CALORIE COUNTING METHOD AND APPARATUS

Stephen R. Ash, LaFayette, Ind., assignor to Willo Partners, Aurora, Ill.

Filed Oct. 26, 1981, Ser. No. 315,246

Int. Cl.³ G01G 23/22, 23/14, 3/00, 1/18, 21/22

U.S. Cl. 177—43 15 Claims



1. Apparatus for determining the caloric content of an entire meal comprising:

(a) a base support structure;

(b) a common planar support structure adapted to support a plurality of food components of different caloric density and including means pivotally mounted on said base support structure; and

(c) scale means connected to said pivotally mounted means at a point remote from said pivotal mounting thereof for weighing said plurality of food components which are positioned on said planar support structure, said scale means including means for indicating the total caloric content of said plurality of food components.

4,387,778

FLUID WEIGHING DEVICE AND METHOD FOR ITS CALLIBRATION AND TESTING

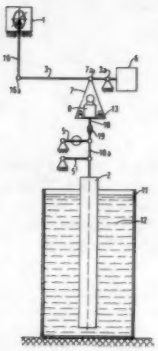
Josef Wohrl, 7114 Pfedelbach, Stuttgart, Fed. Rep. of Germany

Filed Aug. 31, 1981, Ser. No. 298,276

Claims priority, application United Kingdom, Feb. 25, 1981, 8105957

Int. Cl.³ G01G 5/02, 19/52; G01L 25/00; G01F 23/06

U.S. Cl. 177—207 11 Claims



1. A fluid weighing device comprising:

a tank for receiving the fluid to be weighed;

a plunger positioned within the tank and extending between minimum and maximum fluid weighing levels, the horizontal cross-sectional area of the plunger at any intermediate fluid level being a constant ratio to the horizontal cross-sectional area of the tank at that level, and the weight of the plunger being greater than the weight of displaced fluid at the maximum weighing level;

a load measuring cell;

an adjustable counterpoise weight;

a lever means interconnecting the plunger, the load measuring cell and the counterpoise weight such that, when the fluid is at the maximum weighing level, the counterpoise weight will exert a moment on the lever means which will be equal but opposite to the moment exerted by the plunger, and the load measuring cell will be under zeror load;

the load measuring cell being adjusted so that the application of zero load will produce a signal equivalent to the fluid upthrust on the plunger when the fluid is at the maximum weighing level, and so that the load applied to the load measuring cell when the fluid is at a lower level will produce a signal equivalent to the fluid upthrust on the plunger at that fluid level;

a weight indicator operated by the load measuring cell and programmed to take account of the constant ratio so that the true weight of the fluid above the minimum weighing level will be indicated;

means for disconnecting the plunger from the lever means during callibration or testing of the fluid weighing device;

a weight for connection to a predetermined position on the lever means after the disconnection of the plunger, the weight and predetermined position being such that a moment will be applied to the lever means which will be equal to the moment which would be applied by the plunger when the fluid is at the maximum weighing level, and

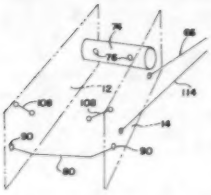
a series of callibrated weights for sequential attachment to a predetermined attachment position on the lever means after disconnection of the plunger and connection of the weight, the callibrated weights and their attachment position being such that they will apply respective test moments to the lever means corresponding with predetermined fluid levels.

4,387,779

SIDEBOOM CRAWLER SUSPENSION

Marino J. Pisani, North Riverside, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

PCT No. PCT/US81/00409, § 371 Date Mar. 30, 1981, § 102(e) Date Mar. 30, 1981, PCT Pub. No. WO82/03363, PCT Pub. Date Oct. 14, 1982
PCT Filed Mar. 30, 1981, Ser. No. 280,951
Int. Cl.³ B62D 55/06
U.S. Cl. 180—9.5 8 Claims



3. In a crawler having a main frame, and a laterally spaced pair of vertically disposed track frames at either side thereof, improved means providing connections of the main frame to separate mounting points on the respective track frames, comprising:

a cross bar providing rigid mounting connections to the forward ends of the track frames;

shaft structure including stress relieved mounting connections to the rear end portions of the track frames allowing slight deflections of the shaft structure without consequent twist force exerted in the rear end portions of the track frames; and

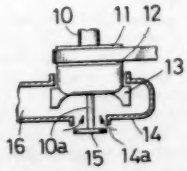
braces having stress relieved mounting connections to both the main frame and to the top of the track frames so as to accommodate, without exerting a consequent twist force, deflections of the shaft structure while cooperating therewith as a guide linkage to prevent the rear end portions of the track frames from twisting out of the vertical plane.

4,387,780

APPARATUS FOR COOLING AN ENGINE

Tetsuzo Fujikawa, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Division of Ser. No. 158,440, Jun. 11, 1980, Pat. No. 4,340,123.
This application Jan. 7, 1982, Ser. No. 337,582
Claims priority, application Japan, Jun. 13, 1979, 54-74899
Int. Cl.³ F01P 7/02
U.S. Cl. 180—54 A 3 Claims



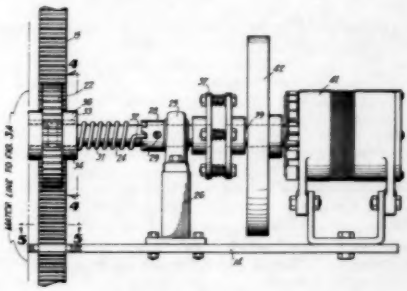
1. Variable air supply apparatus for cooling an engine having a belt speed converter connected to an output shaft of the engine, the converter including a fixed sheave secured to the output shaft and a movable sheave axially movable relative to said fixed sheave and rotatable therewith said movable sheave responding to changes in the engine speed and having an axial position which is related to the rotational speed of the engine, the sheaves forming a space therebetween that receives a belt, said apparatus comprising a fan adapted to be attached to said movable sheave and to produce positive air flow when said engine rotates, a casing around said fan and having an air inlet opening, an air outlet duct communicating with said casing and mounted to convey air to cool the engine, and a valve member adjacent said inlet opening and axially movable with said movable sheave to substantially close said air inlet opening of said casing as said movable sheave moves toward said fixed sheave.

4,387,781

ELECTRICAL GENERATING SYSTEM FOR VEHICLES

Harry E. Ezell, and Norwood B. Ezell, both of P.O. Box 9008, Mobile, Ala. 36691

Filed Feb. 2, 1981, Ser. No. 230,866
Int. Cl.³ B60K 25/10
U.S. Cl. 180—65 B 9 Claims



1. In a system for generating electrical power for a vehicle having a relatively movable frame member and axle connected by a resilient suspension, a pair of opposing rotary current generating devices mounted in coaxial relationship on said frame member, flywheel means connected directly to and rotatable respectively with said generating devices for respectively maintaining the rotation of said devices during periods in which no external force is applied thereto, direct driving means including an alternately oppositely rotating element common to the generating devices connected with and driven by said axle during the rise and fall thereof relative to the frame member, and oppositely active and inactive one-way rotational drive means respectively connected between said generating devices and said alternately oppositely rotating element.

4,387,782

HYDRAULIC POWER STEERING SYSTEM

Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 62,595, Jul. 31, 1979, abandoned. This application Mar. 23, 1981, Ser. No. 246,797
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838417
Int. Cl.³ B62D 5/06
U.S. Cl. 180—132 7 Claims

1. A hydraulic power steering parking system for motor vehicles including wheels thereon and provided with power steering means comprising

a multiple-position final valve control element;

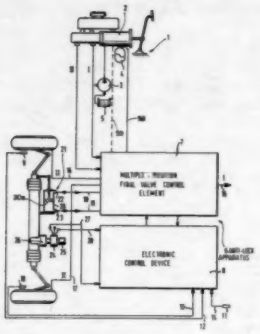
a hydraulic brake system having means connected for sup-

plying amplified energy impulses thereof coupled to said multiple-position final valve control element,

said multiple-position final valve control element having a plurality of final control elements and a slide valve for control of each of the plurality of final control elements, two of said final control elements receiving pressure medium selectively from said slide valves for actuation of the final control elements,

a plurality of sensors for detecting the rotational speed of said wheels,

a power steering transducer for sending out signals in accordance with the rotational position of a steering mechanism,



a magnetic valve for controlling anti-lock means for the wheels,

an electronic control means responsive to signals received from said plurality of sensors and said power steering transducer effective for sending signals only during predetermined speed ranges to said magnetic valve which controls by means of said slide valve one of the two final control elements,

at least four of said plurality of final valve control elements constituting an anti-lock control valve means for each wheel brake, and

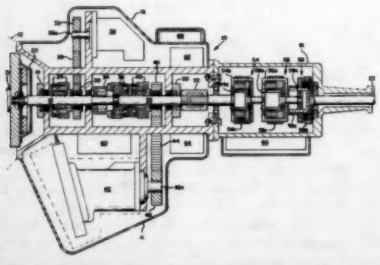
said electronic control means, said magnetic valve and said two final control elements jointly performing control of said power steering means.

4,387,783

FUEL-EFFICIENT ENERGY STORAGE AUTOMOTIVE DRIVE SYSTEM

Vincent E. Carman, Portland, Oreg., assignor to Advanced Energy Systems Inc., Portland, Oreg.

Filed Sep. 4, 1980, Ser. No. 184,103
Int. Cl.³ B60K *9/00*; F15B *1/02*
U.S. Cl. 180—165 **6 Claims**



1. In a wheeled vehicle having an engine, a vehicle drive system comprising:

(a) energy storage means for collecting and storing energy;

(b) power transmission means mechanically coupled to at least one wheel of said vehicle for driving said wheel;

(c) transmission mode selection means for selecting connection of said power transmission means to said energy storage means and to said engine respectively, alternatively either in a first mode wherein said power transmission means receives more energy to drive said wheel from said energy storage means than from said engine, or in a second mode wherein said power transmission means receives more energy to drive said wheel from said engine than from said energy storage means;

(d) means for coupling said engine to said energy storage means for transmitting energy from said engine to said storage means for storage therein;

(e) energy sensor means connected to said energy storage means for sensing the amount of energy stored therein;

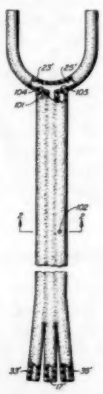
(f) engine starting means automatically responsive to said energy sensor means and to said transmission mode selection means for alternatively starting said engine in response to a drop in the energy in said storage means to a predetermined minimum value automatically in response to selecting connection of said power transmission means in said first mode, or starting said engine, although the energy in said storage means is above said predetermined minimum value, automatically in response to selecting connection of said power transmission means in said second mode.

4,387,784

STETHOSCOPE WITH IMPROVED RESONANT CAVITY AMPLIFICATION

Raymond R. Hill, 310 Diogenes Dr., Angwin, Calif. 94508

Filed Oct. 6, 1981, Ser. No. 309,030
Int. Cl.³ A61B *7/02*; H04R *25/00*
U.S. Cl. 181—131 **14 Claims**

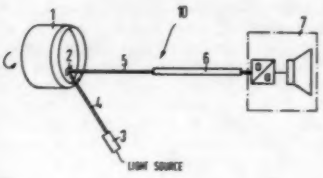


1. In a stethoscope having a sound pick-up head and at least one ear piece that are connected at opposite ends of an enclosed sound transmission passage therebetween, a sound amplifying structure comprising an elongated resonant cavity connected at one end to said enclosed sound transmission passage in the vicinity of said pick-up head, thereby allowing soundwaves from said pick-up head to simultaneously pass into both the resonant cavity and enclosed passage, a vent of said cavity to the atmosphere being provided through a side wall thereof, whereby an unvented length of said cavity from its connection with said sound transmission passage to said vent determining the range of sound frequencies detected at the pick-up head that are amplified at the ear piece.

4,387,785
OPTICAL DEVICE FOR MONITORING CRITICAL SPEEDS OF A ROTATING MEMBER

Ingrid Fromm, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 27, 1980, Ser. No. 181,695
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936893
Int. Cl.³ G01P 1/08, 3/48
U.S. Cl. 181—142 12 Claims

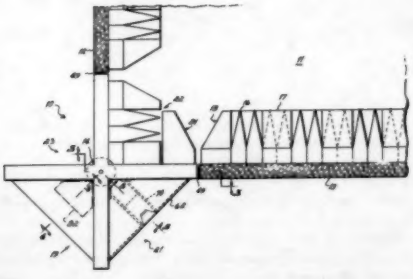


1. An optical device for monitoring critical speeds of a rotating member having a periphery, said device including at least one reflector being arranged on a surface of the rotating member near the periphery of the member to rotate in a circular path, a light source producing an input beam, means for directing the input beam toward a point of the circular path of the reflector at a given angle of incidence, a light waveguide being arranged at a suitable interval from the circular path and at a suitable angle to receive a reflected beam from said reflector which occurs when the input beam is reflected by said reflector, and an opto-acoustical transducer being connected to said light waveguide to receive the reflected beam and convert light pulses into sound, said opto-acoustical transducer being provided with a resonator, which exhibits a natural resonance which is matched to a pulse frequency of the reflected beam produced by the reflector when the rotating member is at a critical speed so that when the rotating member reaches the critical speed, the transducer with the resonator emits an acoustical alarm.

4,387,786
ANECHOIC CHAMBER ARRANGEMENT

Paul W. Klipsch, and James R. Hunter, both of Hope, Ark., assignors to Klipsch and Associates, Inc., Hope, Ark.

Filed Jun. 8, 1981, Ser. No. 271,514
Int. Cl.³ H05K 5/00; E04B 1/82; A47B 81/06
U.S. Cl. 181—150 4 Claims



1. An anechoic chamber arrangement for testing different types, or operational modes, of sound generating devices comprising:

an enclosed chamber having a plurality of sound absorbent interior surfaces and including two substantially vertical walls having such interior surfaces extending toward one another at an angle and terminating to define an open corner;

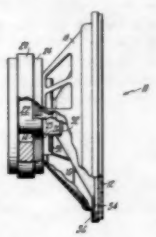
a rotatable door mounted for rotation about a substantially vertical axis at the open corner and having at least three substantially vertical wall vanes meeting to form at least two rotatable corners at said axis, the rotatable door being located such that rotation of the door may position a selected one of said rotatable corners in the open corner with a wall vane extending toward and substantially parallel to each of the two said vertical walls; and

means for sealing the space between the enclosed chamber and the door vanes when the wall vanes are aligned with the walls of the chamber, the interior surfaces of one pair of vanes defining a rotatable corner being sound absorbent whereby, when this pair of wall vanes is sealed into position as a corner of the closed chamber, the enclosed chamber serves as a conventional anechoic chamber, the interior surfaces of a second pair of vanes defining a rotatable corner which is enclosed by a substantially flat panel attached to the vanes and lying in a generally vertical plane inwardly toward the interior of the chamber with the panel including means for mounting loudspeakers therein for tests.

4,387,787
LOUDSPEAKER HAVING ACOUSTIC IMPEDANCE FRONTAL LOADING ELEMENT

John A. King, Martinsville, Ind., assignor to Harman International Industries, Northridge, Calif.

Filed Apr. 20, 1981, Ser. No. 255,401
Int. Cl.³ H04R 1/28
U.S. Cl. 181—155 11 Claims



1. A direct radiating dynamic loudspeaker of the type having low mass diaphragm and magnet means, the improvement comprising:

a substantially planar acoustic impedance means positioned in front of and covering the projected frontal area of the diaphragm;

said acoustic impedance means being nonrigid and being supported only at the periphery thereof; and

said acoustic impedance means composed of fibrous material having an airflow resistance providing a Q less than about 1.2.

4,387,788
DIAPHRAGM PRESSURE RING FOR TONE GENERATORS

Michael Slavin, Troy, and Irvin B. Rea, Royal Oak, both of Mich., assignors to Lectron Products, Inc., Rochester, Mich.

Filed Jan. 21, 1982, Ser. No. 341,442
Int. Cl.³ H04R 7/00
U.S. Cl. 181—171 7 Claims

1. A diaphragm pressure ring for tone generators of the type having a housing provided with a sound cavity, an annular supporting surface adjacent to said cavity, and a diaphragm

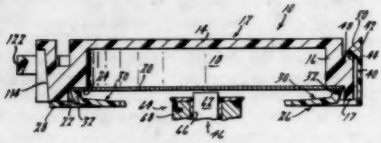
closing said cavity disposed with the outer marginal portion thereof seated on said supporting surface, said ring comprising

an annular member,

a plurality of flexible and resilient cantilevers on said annular member, and

pressure applicator members on the free ends of said cantilevers,

said cantilevers being spaced substantially equidistantly around and disposed substantially in the same plane as and at one side of said annular member,



said pressure applicators extending axially in the same direction from said cantilevers and collectively lying in a circular path of substantially the same diameter as said supporting surface; and

means for fastening the annular member of said pressure ring to the tone generator housing with said cantilevers disposed free from engagement with said housing and said diaphragm with said pressure applicator members overlying and in pressed engagement with the seated marginal portion of said diaphragm and with said cantilevers stressed to maintain said pressed engagement.

4,387,789

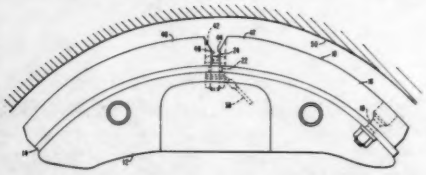
ELECTRICAL BRAKE LINING WEAR INDICATOR

Dennis A. Borugian, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 86,218, Oct. 18, 1979, abandoned, which is a continuation of Ser. No. 934,570, Aug. 17, 1978, abandoned, which is a continuation of Ser. No. 827,997, Aug. 26, 1977, abandoned, which is a continuation of Ser. No. 707,435, Jul. 21, 1976, abandoned. This application Nov. 7, 1980, Ser. No. 205,029

Int. Cl.³ B60T *17/22*; F16D *66/02*

U.S. Cl. 188—1.11 **1 Claim**



1. An indicator for indicating a predetermined amount of wear of a brake lining comprising: a brake lining support member adapted for assembly in a brake mechanism to be supported thereby, said brake lining being mechanically fastened to said brake lining support member by a plurality of bolts, said brake lining adapted to frictionally engage a rotating member associated with said brake mechanism, an electrical contact resiliently disposed on said brake lining support member and insulated therefrom by a shouldered resilient insulating bushing, said electrical contact comprising a threaded bolt attached to said brake lining support member and held thereon by a threaded nut, said insulating bushing completely surrounding said threaded bolt and extending through said support member to insulate said threaded bolt from said brake lining support member, a resilient annular insulating washer surrounding said bolt and disposed between said brake lining support member and said nut to further insulate said nut and bolt combination from said brake lining support member, said nut capturing an electrical connector on said bolt to electrically connect it thereto, said electrical connector electrically connected to an insulated wire member, said brake lining support member being a brake shoe comprising a brake shoe table supported by and attached to a brake shoe web and said rotating member being a brake drum, said brake lining being provided in two, separate longitudinal segments on said brake shoe table and said threaded bolt having a head disposed within a groove formed in a longitudinal end of each of said lining segments and within an opening separating said two segments of said lining midway from the end of said table, the threaded shank of said bolt being disposed in an aperture in said brake shoe table offset on said table from an intersection of said brake shoe table and said brake shoe web, said head of said threaded bolt having a cylindrical head portion which engages the groove in each of said lining segments and acts as said electrical contact, said threaded bolt being of brass and which material is a softer material than said drum and of a greater height than the bolt heads of the bolts that mechanically fasten said brake linings to said brake shoe table and said insulating bushing being provided with an annular shoulder seated directly on said brake shoe table and disposed adjacent to said head portion to insulate said portion from said brake shoe table, said insulating washer disposed on the side of said brake shoe table opposite said annular shoulder, said resilient insulating bushing and said annular insulating washer maintaining said threaded bolt and said nut in spaced relation from said brake shoe table and said threaded bolt and nut assembly floating with respect to said brake shoe table to accommodate rotating irregularities in alignment between said drum and said brake shoe table.

4,387,790

WEBBING LOCKING DEVICE

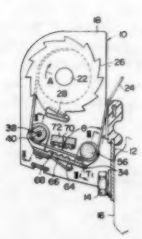
Jun Yasumatsu, Toyota; Hiroshi Tsuge, Chiryu, and Takashi Kawaharazaki, Toyoake, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan

Filed Mar. 16, 1981, Ser. No. 243,695

Claims priority, application Japan, Mar. 21, 1980, 55-37613[U]; Mar. 21, 1980, 55-37614[U]

Int. Cl.³ A62B *35/00*

U.S. Cl. 188—65.3 **7 Claims**



1. A webbing locking device used in a seatbelt system for clamping an intermediate portion of an occupant restraining webbing in a vehicular emergency, comprising:

a frame secured to a vehicle body;

a lock lever pivotally supported on said frame by a support shaft;

lock means for clampingly locking the intermediate portion of the webbing when said lock lever pivots during a vehicular emergency;

a first roller rotatably supported on said lock lever, and placed in a position remote from said support shaft, around which the intermediate portion of the webbing is guided, so that said lock lever is pivoted by said first roller when the tension in the webbing increases;

supporting means between said lock lever and axially oppo-

site ends of said first roller for rotatably supporting said first roller on said lock lever and enabling said first roller to move in a radial direction with respect to said first roller;

contact means for contacting the outer periphery of said first roller only when said first roller moves in said radial direction, to give a frictional resistance to the rotation of said first roller; and

the supporting means comprising a first portion secured to the lock lever, a separate second portion secured to the first roller, and resilient biasing means, the first and second portions normally being resiliently urged by the biasing means toward each other into contact so as to maintain the periphery of the roller away from the contacting means, whereupon when the tension in the webbing exceeds a predetermined value the first and second portions are caused to move relative to each other in a direction that brings the periphery of the first roller toward the contacting means,and the first and second portions are caused to move further apart in opposition to the resilient biasing means;

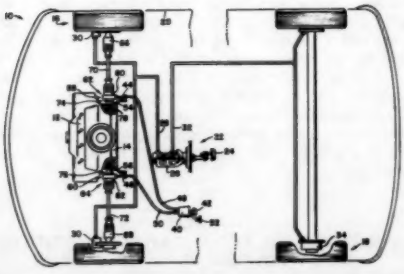
whereby, in the vehicular emergency, the tension in a portion of the webbing clamped by said lock means is reduced by said frictional resistance to rotation of said first roller.

4,387,791

PARKING BRAKE FOR FRONT WHEEL DRIVE VEHICLE INCLUDING BRAKE BAND FOR UNIVERSAL JOINT

Irving R. Ritsema, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 2, 1981, Ser. No. 239,298
Int. Cl.³ F16D *51/00*
U.S. Cl. 188—77 R **4 Claims**



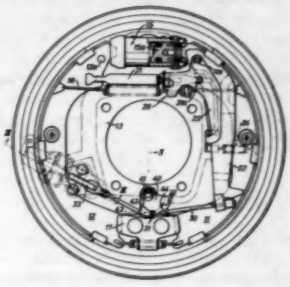
1. In a brake system for a front wheel drive vehicle having an engine coupled to a transmission which imparts movement to a pair of front wheels via universal joints, a first pair of brake assemblies cooperting with the pair of front wheels during a service brake application to stop the vehicle, a second pair of brake assemblies cooperating with a pair of rear wheels during a service brake application to also stop the vehicle, and a parking brake assembly operable during a parking brake application to substantially prevent movement of the vehicle, characterized by said parking brake assembly comprising a pair of bands which are contracted during the parking brake application to frictionally engage a pair of said universal joints.

4,387,792

MECHANICAL PARKING BRAKE MECHANISMS

Noriaki Imamura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 2, 1981, Ser. No. 269,598
Claims priority, application Japan, Jul. 31, 1980, 55-106622
Int. Cl.³ F16D *51/00*
U.S. Cl. 188—328 **4 Claims**



1. A mechanical parking brake mechanism including a parking lever assembled within a drum brake assembly and connected with a parking brake wire to be manually operated, said parking lever being arranged to cooperate with a strut of said drum brake assembly so as to displace a pair of brake shoes outwardly toward the inner periphery of a brake drum, said parking brake mechanism comprising:

a sector pulley pivoted to the backing plate of said brake drum and having a semi-circular guide face for guiding an intermediate portion of said parking brake wire, said semi-circular guide face being formed with at least two radial recesses spaced from each other at a predetermined interval; and

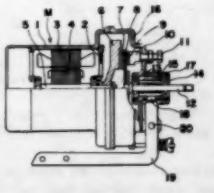
at least two projections integrally provided on the intermediate portion of said parking brake wire and arranged to be selectively engaged with the respective radial recesses in accordance with the length of pulling stroke of said wire to rotate said sector pulley in response to the movement of said parking brake wire.

4,387,793

CLUTCH MOTOR ARRANGEMENT

Nobukazu Sugano, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 26, 1980, Ser. No. 210,571
Claims priority, application Japan, Nov. 26, 1979, 54-153322; Feb. 12, 1980, 55-16265
Int. Cl.³ B60K *41/02*
U.S. Cl. 192—0.02 R **8 Claims**



1. A clutch motor arrangement including an electric motor equipped with a fly wheel mounted on a motor output shaft of the electric motor and a clutch mechanism movably supported

so as to reciprocate in an axial direction of said electric motor to be selectively brought into contact with and spaced from said fly wheel through operation of a clutch operating lever so as to intermittently transmit torque of the electric motor to a clutch output shaft of said clutch mechanism by operating said clutch operating lever, said clutch motor arrangement further comprising a detection device operatively positioned for detecting functioning of said clutch mechanism, and control means for controlling voltage applied to said electric motor and including a control device connected between said detection device and said electric motor and responsive to said detection device to apply to said electric motor full power source voltage and voltage close thereto during an operative ON state of said clutch mechanism, and to apply to said electric motor voltage lower than the power source voltage during an inoperative OFF state of said clutch mechanism.

4,387,794

SINGLE-SURFACE ELECTROMAGNETICALLY OPERATED CLUTCH/BRAKE UNIT

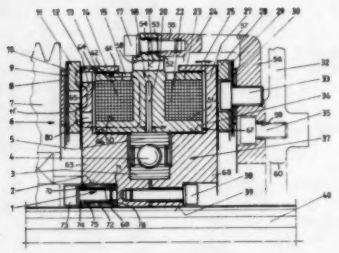
Rudolf Schneider, and Siegfried Winkelmann, both of Tettnang, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 3, 1980, Ser. No. 212,637

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948728

Int. Cl.³ F16D *67/06*

U.S. Cl. 192—18 B **6 Claims**



1. An electromagnetically operable clutch and brake device for braking rotation of a shaft relative to a housing and coupling said shaft to a driven element, said device comprising:

an annular magnetic body having

an outer flange for attachment to said housing,

a pair of pole-forming portions inwardly of said flange and having opposite axially open recesses,

a pair of respective annular coils received in said recesses, and

an inner surface defining the inner diameter of said body;

a rotor assembly receiving said body and comprising

a clutch disc juxtaposed with said element, a brake disc juxtaposed with said housing,

means fastening said discs axially together, each of said discs reaching around and enclosing a respective one of said pole portions, said assembly being received on said shaft with freedom of axial and angular displacement, and

a roller bearing having an inner race clamped between said discs and an outer race radially abutting said surface but axially shiftable relative thereto;

respective armatures between said housing and said brake disc and between said element and said clutch disc; and

means for locking said assembly to said shaft.

4,387,795

INTER-AXLE TRANSMISSION APPARATUS

Otto Mueller, 13 Byfield La., Dearborn, Mich. 48120

Filed Jan. 14, 1977, Ser. No. 759,340

Int. Cl.³ F16H *37/06*

U.S. Cl. 192—60 **10 Claims**

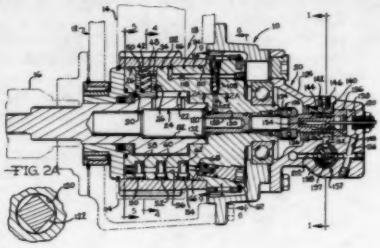


FIG. 24

1. In an inter-axle transmission having a rotary input member and a rotary output member, apparatus comprising a torque transmitting mechanism operatively connected between said input member and said output member, said torque transmitting mechanism being connected between said members for actuation to a first position of operation for transmitting substantially no torque from said input member to said output member and wherein substantially free-wheeling of the output member relative to the input member can occur and to a second position of operation for transmitting torque from said input member to said output member and wherein a limited slippage of the output member relative to the input member can occur, and an actuator means associated with said torque transmitting mechanism and actuable to place said torque transmitting mechanism selectively in either said first position or said second position, said actuator means including an assembly hydraulically actuable to move to a retracted position or to an extended position to maintain said torque transmitting mechanism in its first or its second position, valve means for directing hydraulic fluid under pressure to said assembly for moving said assembly either to said retracted position or to said extended position, and a remote control means for actuating said valve means for directing the hydraulic fluid to the assembly for moving said assembly to the selected position, said remote control means being a push-pull cable, and said valve means includes a movable spool to which said cable is connected to enable the spool to be moved from a remote location, said spool being rotatable about its axis to two separate positions for directing fluid to move said assembly respectively either to its retracted position or to its extended position, said spool also being movable axially in one direction to enable fluid under pressure to be directed to said assembly and movable axially in the other direction to block fluid pressure to said assembly.

4,387,796

APPARATUS FOR FEEDING BILLETS OR THE LIKE INTO A FORGING PRESS OR THE LIKE

Satoru Enomae, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 220,980

Claims priority, application Japan, Dec. 27, 1979, 54-169145; Dec. 27, 1979, 54-180210; Dec. 27, 1979, 54-180211

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—374 **8 Claims**

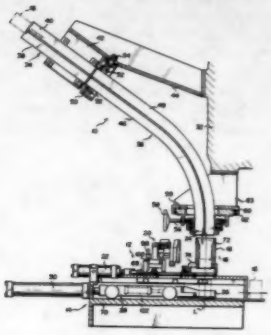
1. Apparatus for feeding articles to a desired destination in either of two different attitudes, comprising:

(a) chute means for conveying successive articles therethrough, the chute means having an exit end;

(b) infeed means for transporting the articles from a loading position to the desired destination; and

(c) selective loading means comprising:

(1) first loading means for loading each article coming out of the exit end of the chute means onto the infeed means in a first upstanding attitude;
(2) second loading means for loading each article coming out of the exit end of the chute means onto the infeed



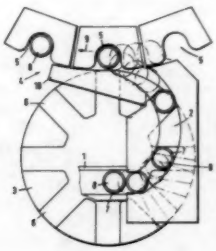
means in a second recumbent attitude by changing its orientation; and
(3) changeover means for selectively moving the first and second loading means to and from a working position between the chute means and the infeed means.

4,387,797

METHOD AND DEVICE FOR TRANSMITTING CROWN CORKS

Friedrich Rademacher, Kamen-Südkamen, Fed. Rep. of Germany, assignor to Holstein und Kappert GmbH, Dortmund, Fed. Rep. of Germany

Filed Aug. 8, 1980, Ser. No. 176,573
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1979, 2932339
Int. Cl.³ B65G *47/31, 47/80*
U.S. Cl. 198—461 6 Claims



2. Arrangement for transferring crown corks from a supply source to a capping location comprising a capping device movable along a circular path and having individual receiving pockets spaced angularly apart along the circular path, means forming an aligning track and arranged for moving a row of crown corks from the supply source to a rectilinearly extending outlet opening from said aligning track, means forming a horizontally arranged stationary spirally extending shaped guide track located in a single plane for receiving individual crown corks from the outlet opening of said aligning track and for guiding the crown corks individually and in spaced relation to the receiving pockets in said capping device, a horizontally arranged rotatable conveying disk vertically spaced from said guide track and having a central axis of rotation and a conveying surface extending radially outwardly from and transversely of the central axis, said conveying surface having a circular circumferential periphery, said rectilinearly extending outlet opening spaced between said central axis and said circumferential periphery, said conveying disk having generally radially outwardly extending guide surfaces extending to the circumferential periphery and arranged to engage the crown corks for adjusting the spacing of the crown corks, said conveying surface arranged to rotate passing in a plane generally parallel and adjacent to the plane of said guide track so that said conveying surface contacts the crown corks in said guide track and moves the crown corks individually along said guide track from said aligning track to said capping device and at the same time adjusting the spacing of the crown corks to correspond to the spacing of the receiving pockets in said capping device.

4,387,798

CASCADING CONVEYOR SYSTEM

Will B. Jamison, Bethel Park, and David R. Hazen, McMurray, both of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Continuation of Ser. No. 809,858, Jun. 24, 1977, abandoned, which is a continuation of Ser. No. 679,007, Apr. 21, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 921,710
Int. Cl.³ B65G *21/10*
U.S. Cl. 198—587 5 Claims

1. A conveyor system for transporting mined material in a mine comprising,
a plurality of longitudinally extending conveyor assemblies each having an independent endless conveyor,
said endless conveyor assemblies each having a receiving end portion and a discharging end portion,
said receiving end portion of each of said endless conveyor assemblies having an enlarged surface area maintained in underlying relation with said discharging end of an adjacent endless conveyor assembly for receiving the mined material discharged therefrom,
drive means positioned on each conveyor assembly for rotating said endless conveyor at a preselected speed to transport the mined material from said receiving end portion to said discharging end portion,
said discharging end portion of each of said conveyor assemblies arranged in overlapping relation with said receiving end portion of an adjacent conveyor assembly,
said receiving end portion pivotally connected to said discharging end portion to permit conveyance of mined material along a curved path formed by said endless conveyors,
a roof engaging member for supporting each of said conveyor assemblies for longitudinal movement adjacent the mine roof,
ground engaging means for securing said roof engaging member to the mine roof,
each of said endless conveyor discharging end portions having a yoke member extending from said respective conveyor discharging end portion into overlying relation with said receiving end portion of an adjacent conveyor assembly,
each of said endless conveyor receiving end portions having an upwardly extending bracket member with a pivot plate extending forwardly therefrom,
said pivot plate being secured at one end to said upwardly extending bracket member and extending above said endless conveyor receiving end portion into underlying relation with said yoke member,

a conveyor support member secured at one end to said roof engaging member and detachably secured at the other end to said upwardly extending bracket member,

said conveyor support member arranged to connect said endless conveyor receiving end portion to said roof engaging member and support said endless conveyor receiving end portion in an elevated position for longitudinal movement on said roof engaging member,

said conveyor support member having connecting members rotatably supported on said roof engaging member and extending vertically downward toward each of said conveyor assemblies,

a pivot support extending upwardly from said receiving end portion of each of said conveyor assemblies adjacent to the lower end portion of said connecting members,

means for connecting said pivot support to said connecting members and thereby suspend each of said conveyor assemblies from the mine roof for longitudinal movement relative thereto,

a vertical pivot pin connecting said pivot plate to said yoke member, and

said yoke member being pivotally connected to said pivot plate by said pivot pin to permit horizontal pivotal movement of the adjacent end portion of said endless conveyor assembly about a vertical axis and support said adjacent endless conveyor discharging end portion from a common conveyor support member.

4,387,799

TAPERED BED FEEDER

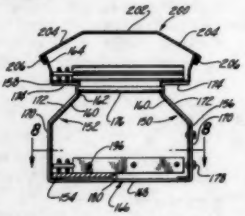
Raymond G. Sweeney, Little Chute, and William L. Rammer, Kaukauna, both of Wis., assignors to Badger Northland, Inc., Kaukauna, Wis.

PCT No. PCT/US80/00906, § 371 Date Jul. 14, 1980, § 102(e) Date Jul. 14, 1980, PCT Pub. No. WO82/00283, PCT Pub. Date Feb. 4, 1982

PCT Filed Jul. 14, 1980, Ser. No. 273,883

Int. Cl.³ B65G *19/28*

U.S. Cl. 198—735 **9 Claims**



1. A tapered bed feeder conveyor including an elongated center section, a tapered bed secured to the center section, an idler shaft rotatably journaled on the idler shaft support, at least one conveyor sprocket secured to the idler shaft, a drive shaft support secured to the other end of the center section, a drive shaft rotatably journaled on the drive shaft support, at least one conveyor sprocket secured to the drive shaft, at least one endless chain trained around the sprockets on the idler shaft and the drive shaft, conveyor slats extending from the endless chain operable to convey material along the upper surface of the tapered bed and a conveyor drive operable to drive the drive shaft characterized by the elongated center section including two reversible and identical side panel members formed from sheet metal with an integral tapered bed support ledge and an integral endless chain return support ledge, each side panel member including upper and lower edges and at least one sloping section intermediate the edges enabling the side panels to nest together while disassembled with one of the side panels turned end for end and corresponding upper and lower edges on adjacent nested panel members being vertically and horizontally offset from each other; and a plurality of spacer bracket assemblies connecting one panel member to the other panel member in a parallel spaced apart relationship.

4,387,800

WALKING-BEAM CONVEYOR

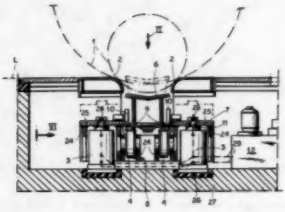
Oskar Noe, Mühlheim am Ruhr, Fed. Rep. of Germany, assignor to BWG Bergwerk- Und Walzwerk- Maschinenbau GmbH, Duisburg, Fed. Rep. of Germany

Filed Oct. 15, 1980, Ser. No. 197,168

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016158

Int. Cl.³ B65G *23/00*

U.S. Cl. 198—750 **8 Claims**



6. A walking-beam conveyor comprising:

a pair of horizontally and longitudinally extending and parallel fixed beams;

a central movable beam between and parallel to said fixed beams;

means for vertically reciprocating said movable beam;

a housing suspended from said movable beam;

means for preventing said housing from moving longitudinally relative to said fixed beams;

a rack mounted on and extending longitudinally along said movable beam;

a pinion mounted on said housing and in mesh with said rack; and

a motor carrying said pinion and mounted on said housing.

4,387,801

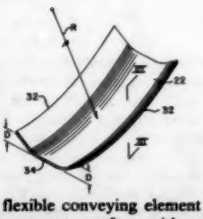
CONVEYOR BELT

Merle L. Hoover, deceased, late of Franklin, Pa. (by Nancy S. Hoover, executrix), assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 69,664, Aug. 24, 1979, abandoned. This application Jan. 12, 1981, Ser. No. 224,419

Int. Cl.³ B65G *15/08, 15/34*

U.S. Cl. 198—821 **19 Claims**



1. In an endless flexible conveying element adapted to be mounted on a carrier means to conform with a generally curvilinear endless path for orbital traverse of such endless path and wherein an elongated resiliently deformable portion of said conveying element includes a longitudinally extending central portion located laterally intermediate longitudinally extending side portions thereof and said resiliently deformable portion

laterally flexes to permit traverse thereby of laterally curvilinear portions of said path in an upright orientation, the improvement comprising:

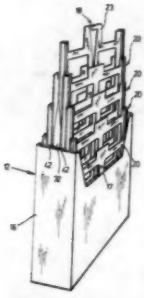
said resiliently deformable portion having an innate tendency to spontaneously assume a natural form thereof which is configured such that said resiliently deformable portion, when mounted on such carrier means, is deformed from said natural form in a manner to provide in said side portions a condition of relative longitudinal tension with respect to said central portion which is substantially continuously maintained throughout such lateral flexing of said resiliently deformable portion.

4,387,802

CONTAINER FOR THIN FLAT ARTICLES

Scott J. G. Shearing, 16 Waterfield Dr., Scarborough, Ontario, Canada (M1P 3W5), and Ronald R. Bache, 14 Queensdale Ave., Toronto, Ontario, Canada (M4J 1X9)

Filed Jul. 24, 1981, Ser. No. 286,329
Int. Cl.³ B65D 5/50
U.S. Cl. 206—45 **8 Claims**



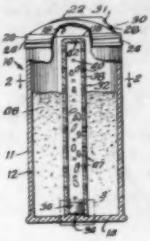
1. A container for thin, flat articles comprising a box-like housing having an opening through which each article can be inserted into the housing and removed therefrom in a direction lying in the plane of the article, and a series of article support members within the housing in side-by-side parallel relationship to enable each article to be received between a respective adjacent pair of support members, the housing having internal grooves extending inwardly from the opening and at least some of the support members having side edges slidably received in said grooves, one of the support members being a primary support member having manually grippable means to enable the primary support member to be at least partially pulled out of the container through the opening, the other support members being secondary support members, means interconnecting each adjacent pair of support members to cause manual pulling of the primary support member at least partially out of the container through the opening to successively pull the secondary support members at least partially out of the container through the opening in a telescopic manner by successive operation of respective interconnecting means after each successive support member has been pulled a predetermined distance, and each support member having article support means to cause each article to be at least partially pulled out of the container through the opening with its associated support member thereby displaying the articles in staggered relationship.

4,387,803

ABSORBENT DEVICE FOR CONTAINERS FOR SUGAR, SALT, ETC.

Robert A. Mercil, Star Rte., Box 315, Wetmore, Mich. 49895

Filed Nov. 21, 1980, Ser. No. 208,884
Int. Cl.³ B65D 81/24, 83/06
U.S. Cl. 206—204 **4 Claims**



1. A container for condiment, comprising,

a main container generally closed, having an imperforate bottom element, a surrounding wall defining a top opening, and a removable perforated cover, and

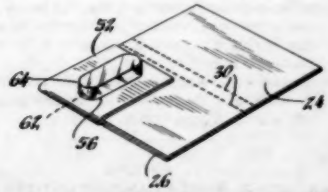
an inner container of tubular form having an open lower end and a closed upper end, the bottom element and the inner container including interconnecting elements capable of releasably mounting the inner container on the bottom element in response to manipulating the inner container by manually grasping it at its upper end, the inner container being of such length as to terminate closely adjacent the top opening of the main container, the inner container being made of material that is rigid and generally continuous but with dimensionally defined holes therethrough spaced apart substantial distance relative to the size of the holes, the holes being of such size as to confine granular material of relatively large size such as rice against escape therethrough, but to enable granular material of relatively small size such as sugar and salt to pass therethrough.

4,387,804

CONVERTIBLE PILL CUP PACKAGE

John J. Austin, Elkhart, Ind., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 171,392, Jul. 23, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,512
Int. Cl.³ B65D 77/00
U.S. Cl. 206—218 **1 Claim**



1. A package comprising paperboard and adapted for containing a preselected amount of a product therein, said package being usable as a cup and comprising:

(a) a pair of side walls joined along mutual edges thereof to define a cup;

(b) a top edge of each of said side walls being unattached to each other to define an open mouth for said cup;

(c) a support flap connected along a first fold line to one of said top edges of said side walls and extending therefrom;

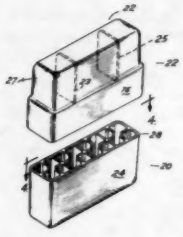
(d) packaging means secured to one face of said support flap for containing said product;
(e) a pair of closely spaced additional parallel fold lines laterally traversing each of said side walls to divide said side walls into equal portions thereby dividing said cup into opposite halves;
(f) said support flap being folded about said first fold line against one of said side walls; and
(g) said side walls being folded about said additional fold lines so as to sandwich said support flap and said packaging means between said opposite halves of said cup.

4,387,805

ARROWHEAD CASE AND ARROWHEAD WRENCH

Charles A. Lanius, Prairie du Sac, Wis., assignor to Flambeau Corporation, Baraboo, Wis.

Filed May 6, 1981, Ser. No. 260,895
Int. Cl.³ B65D *81/36, 85/20*
U.S. Cl. 206—230 **6 Claims**



1. A protective case for arrowheads, each arrowhead having a central shank, a plurality of radially-extending blades and a tip, comprising, in combination:
a base adapted to receive said arrowheads, said base having
a bottom wall,
a side wall, defining a rim,
an internal wall dividing said base into arrowhead compartments, and
two pairs of opposed rib members within each of said compartments, each rib being disposed at approximately 90° to adjacent ribs and terminating in an inner edge to grippingly engage said shank of said arrowhead between said blades, whereby said arrowhead is retained within said compartment, isolated from other arrowheads in the case thereby avoiding dulling of said tip and said blades; and
a cover adapted to receive and enclose said base and the arrowheads therein, said cover including
an offset peripheral portion defining an interior ledge, said rim of said base abutting said interior ledge when the case is closed to resist a compressing force applied to said case, and
a transverse rib which is aligned and abuts said internal dividing wall, thereby further increasing the resistance of the case to compression forces.

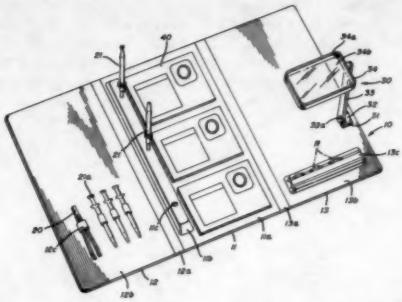
4,387,806

GEM STORAGE, DISPLAY AND INVENTORY CONTROL SYSTEM

Michael M. Poole, 19565 Applebrook Creek, Strongsville, Ohio 44315; Samuel G. Solitt, 2121 Brookshire Rd., Akron, Ohio 44313, and Jerry Shaw, 50 W. Fairlawn Blvd., Akron, Ohio 44313

Filed Jun. 15, 1981, Ser. No. 273,623
Int. Cl.³ B65D *51/24*
U.S. Cl. 206—232 **4 Claims**

4. A gem storage, display, and inventory control system, comprising:
(A) a storage container;
(B) a display unit;
(C) a control package;
(D) said display unit and said control package being normally removably received in said storage container;



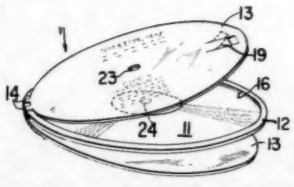
(E) said control package including a pair of temporarily interconnected cards bearing indicia related to a particular gem; and
(F) one of said cards containing means for releasably holding a gem.

4,387,807

RING COVER PROTECTOR FOR RECORDS

Jorge de la Rosa, 239 Beacon Ave., Jersey City, N.J. 07306

Filed Oct. 2, 1981, Ser. No. 308,416
Int. Cl.³ B65D *85/30*
U.S. Cl. 206—312 **2 Claims**



1. A protective cover for phonograph records comprising a circular ring provided with a groove about its inner circumference adapted to snap fit about a record, a flexible cover adjacent each side of the record being hinged to the ring with a stiff wire pin passing through hinge ears and accommodated in a groove in each side of the ring each cover being provided with a hole aligned with the central hole of the record.

4,387,808

SHIPPING DEVICE

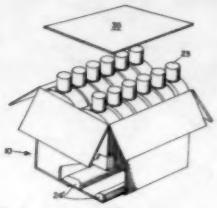
Arthur H. Dornbusch, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 11, 1981, Ser. No. 262,721
Int. Cl.³ B65D *81/00, 85/62*
U.S. Cl. 206—432 **9 Claims**

1. A shipping package comprising:
(a) an array of identical articles to be shipped in a set spacial relationship with one another;
(b) upper and lower article contacting surfaces separated by the approximate height of the articles;
(c) a discontinuous layer of foam thermoplastic material extending across and supported by said lower article contacting surface and comprising a pattern of spaced configurations corresponding to the arrangement of the

articles in said array, said thermoplastic material having a thickness in the range of from about ¼" to about ½"; and

(d) pockets formed in said discontinuous layer of thermoplastic material to the shape of at least part of the lower portions of said articles and designed to maintain said



relationship of all the articles of the array, the pockets being located in positions which correspond with at least certain of said articles in said array and having the lower portions of such articles resting therein;

(e) said thermoplastic material being firmly bonded to said lower article contacting surface, but not to said articles.

4,387,809

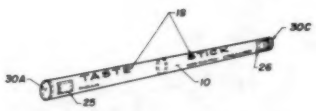
MULTI-COMPARTMENT COMBINATION PACKAGE AND STIRRER DEVICE

Paul C. Botzler, 11548 Glenn Arm Rd., Glen Arm, Md. 21057

Filed May 1, 1981, Ser. No. 259,576

Int. Cl.³ B65D *77/08, 25/04;* **B67D** *5/56*

U.S. Cl. 206—526 **7 Claims**



1. An integral multi-compartment combination package and stirrer device of flexible material comprising:

A hollow tubular body having opposed elongated sides bonded together to form said tubular body,

two end caps each having the cross sectional shape of the finished combination package and stirrer device with a flanged lip around the perimeter at a right angle to the flat surface of said end cap,

one or more compartment separators similar to said end cap,

one said end cap inserted into said tubular body with end cap positioned with flat surface of end cap at right angle to long axis of said tubular body with outside surfaces of flanged lip of said end cap bonded to inside surface of said tubular body at one end or tubular body,

said compartment separators inserted into said tubular body with compartment separators positioned with flat surface of compartment separators at right angle to long axis of said tubular body with outside surface flanged lip of said compartment separators bonded to inside surface of said tubular body at a distance from first bonded end cap to form a compartment within the said tubular body,

second end cap inserted into tubular body at remaining open end of said tubular body and affixed to tubular body indentical to first bonded end cap,

said hollow tubular body having a die cut slot removed or perforated compartment emptying slot cut at one end of each compartment formed in said tubular body for removal of compartment contents,

perforated or tear-away sealable tabs affixed atop of each said compartment emptying slot and said tabs are removable from said tubular body to empty contents of compartment.

4,387,810

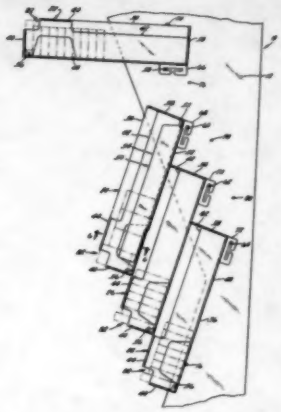
SHINGLED RACK DISPLAY DEVICE

Louis J. Crosslen, Grafton, Wis., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.

Filed Oct. 27, 1980, Ser. No. 201,121

Int. Cl.³ A47F *3/00*

U.S. Cl. 211—49 D **3 Claims**



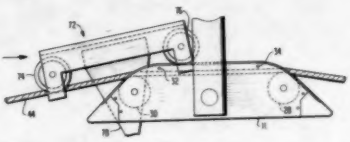
1. A point of purchase merchandise display assembly comprising a pair of generally vertical support walls spaced laterally apart from one another, a plurality of generally rectangular one piece, molded plastic merchandise supporting racks arranged in shingled relationship with one another and each having an upper and lower end, each of said racks also having an open side for access to and loading of said merchandise, a closed side opposite to said open side, and two opposite side walls joining said open and closed sides and further having a plurality of vertically disposed dividers parallel to and between said opposite side walls and integrally molded with said closed side and to form a vertical compartment between adjacent dividers to insure vertical stacking of said merchandise therein, said closed side having a plurality of apertures therein, said apertures being generally between said dividers and for receiving a removable and vertically disposed tongue means therethrough, said tongue means centrally positioned between adjacent dividers to thereby divide said vertical compartment in two, and displacement means at said lower end of said racks to cause said merchandise to be moved outwardly a small extent at said lower end of said racks to facilitate grasping and removal of said merchandise from said racks, each of said racks having a plurality of retaining means adjacent said lower end and abutting said vertically stacked merchandise above said outwardly moved item of said merchandise, means pivotally mounting said upper end to and between said support walls for permitting swinging of said racks between a lower display position and an upper generally horizontal loading position for racks located beneath said generally horizontally disposed racks, said mounting means including pin and bracket means between said racks and said walls to pivotally mount said racks on said walls to permit said swinging thereof, said pin and bracket means including a pin and further including a bracket with a generally T-shaped slot with two opposite ends along its length and which is open intermediate its length to permit removal of said racks from said pin, said racks being swingable to said upper position wherein said pin is located in one of said ends of said T-shaped slots and other means on said walls and engageable by said rack to hold the latter in said upper position, said rack being shiftable to a display position wherein said pin means are located in an opposite end of said T-shaped slot to permit said racks to hang downwardly from said walls and in said shingled relation.

4,387,811
SHOWER SHELF
Meyer J. Ragir, and Joseph B. Mayer, both of Chicago, Ill., assignors to Selfix, Inc., Chicago, Ill.
Filed Mar. 23, 1981, Ser. No. 246,727
Int. Cl.[3] A47F 5/08
U.S. Cl. 211—119 7 Claims

1. A shelf support structure adapted to be suspended from a shaft extending out from the surface of a wall comprising:
a frame comprised of a pair of spaced-apart generally vertical legs, the upper ends of which taper towards each other and merge into the lower ends of a pair of arms of a generally inverted U-shaped gripping portion adapted to be received over said shaft and to retain said shelf structure in place thereon, said vertical legs and said U-shaped gripping portion being formed from a single continuous member to provide the uppermost portion of said shelf structure with an uninterrupted closed configuration;
said arms of said gripping portion tapering towards each other from the base of the inverted U-shaped gripping portion to define at their lower ends a throat at which the spacing between said arms is less than the diameter of said shaft; and
at least one shelf extending between and attached to said vertical legs for supporting articles thereon;
the configuration of said gripping portion coacting with said shaft to retain said structure in position and inhibit both displacement thereof along the axis of said shaft and rotation thereof about the axis of said shaft;
the configuration of the upper ends of said vertical legs and of said pair of arms acting to facilitate guided positioning of said shelf structure on said shaft so that said shaft is guided by said upper ends into said gripping portion when said shelf structure is positioned in relation to said shaft so that said shaft is disposed between said upper ends of said vertical legs, and said shelf structure is moved downwardly with respect to said shaft.

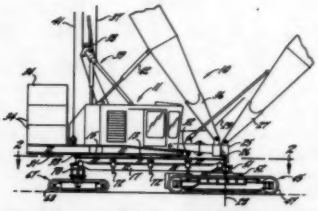
4,387,812
INTERMEDIATE CABLE SUPPORT
Cleveland J. Biller, Morgantown, and David D. Johnson, Booth, both of W. Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Mar. 10, 1981, Ser. No. 242,513
Int. Cl.[3] B63C 19/00
U.S. Cl. 212—176 8 Claims

1. A skyline intermediate support for use in a skyline logging system, which system includes a carriage having sheave wheels which travel over a skyline cable, and means to slacken the skyline cable to allow attachment and removal of logs, comprising in combination:
(a) first means for allowing said carriage to disengage said cable and to pass on the intermediate support;
(b) sheave wheel means mounted on said first means for allowing said skyline cable to pass freely through the



intermediate support and below said carriage as it passes on the intermediate support; and
(c) cable retention means attached to said first means for preventing said cable from disengaging the intermediate support when said cable is slackened and tightened during logging operations.

4,387,813
MOVABLE RING SUPPORTED LIFT CRANE
Daniel E. Beduhn, and James G. Morrow, Sr., both of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.
Continuation of Ser. No. 58,284, Jul. 17, 1979, abandoned. This application Sep. 8, 1981, Ser. No. 300,016
Int. Cl.[3] B66C 23/73, 23/78
U.S. Cl. 212—195 4 Claims



1. In a crane assembly having an upper structure pivoted on a lower car body, the combination comprising, a pair of support beams secured to and forming a part of said lower car body, a track-like ring secured to said beams and horizontally surrounding said lower car body, said beams extending fore and aft beneath and beyond the periphery of said ring, a boom carrier pivoted for vertical movement on said upper structure and riding for rotation on said ring, a boom mounted on said boom carrier for lifting a load, a counterweight carrier pivoted for vertical movement on said upper structure and riding for rotation on said ring, means interconnecting said counterweight carrier and said boom for counteracting a heavy load, and a traveling support for said ring and crane assembly including front and rear pairs of laterally spaced crawler assemblies respectively attached outboard of said ring to the projecting ends of said pair of beams and means including respective frame elements interconnecting the crawler assemblies of each of said front and rear pairs and for supporting said ring between the ends of said support beams, a turntable mounted on the frame element of said front crawler assemblies, a second frame element mounted on the upper portion of said turntable, means for attaching at least a portion of said ring to said second frame element, and said pair of front crawler assemblies each including an endless track and hydraulic motor means for selectively and reversibly driving said tracks to permit move-

ment of said crane and ring over the ground while said boom is lifting a heavy load.

4,387,814

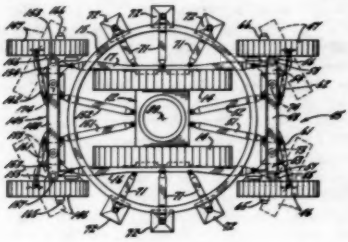
TRAVELING ATTACHMENT FOR RING SUPPORTED LIFT CRANE

Daniel E. Beduhn, and James G. Morrow, Sr., both of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Continuation-in-part of Ser. No. 300,016, Sep. 8, 1981, which is a continuation of Ser. No. 58,284, Jul. 17, 1979, abandoned, and a continuation-in-part of Ser. No. 305,519, Sep. 25, 1981, which is a continuation-in-part of Ser. No. 58,285, Jul. 17, 1979, abandoned. This application Feb. 1, 1982, Ser. No. 344,388

Int. Cl.³ B66C *23/78, 23/73*

U.S. Cl. 212—195 5 Claims



1. In a crane having an upper structure mounted for rotation on a lower carbody including crawler means for moving the crane over the ground, the combination comprising, at least a pair of support beams secured to said lower carbody, a track-like ring secured to said beams and horizontally surrounding said lower carbody and said crawler means, said beams extending fore and aft beneath and beyond the periphery of said ring, a boom carrier pivoted for vertical movement on said upper structure and riding for rotation on said ring, a boom mounted on said boom carrier for lifting a load, a counter-weight carrier mounted for vertical movement on said upper structure and riding for rotation on said ring, means interconnecting said counterweight carrier and said boom for counteracting a heavy load, a first traveling support attachment including a pair of laterally spaced crawler assemblies respectively attached outboard of said ring adjacent the forward ends of said pair of beams by means including a cross frame interconnecting said crawler assemblies and a plurality of frame elements interconnecting said crawler assemblies and said lower carbody for supporting said ring; a second traveling support attachment including a pair of laterally spaced crawler assemblies respectively attached outboard of said ring adjacent the rearward ends of said pair of beams and means including a cross frame interconnecting said crawler assemblies and a plurality of frame elements interconnecting said crawler assemblies and said lower carbody for supporting said ring; said crawler assemblied of said first and second travelling support attachments being connected to said frame elements through vertical pivot posts with means being provided for pivoting said crawler assemblies about the axes of said posts; and said cross frame including jack means mounted thereon to permit movement of said crane and ring over the ground while said boom is lifting a heavy load.

4,387,815

PLASTIC CONTAINERS FOR STORAGE OF GOODS UNDER PRESSURE

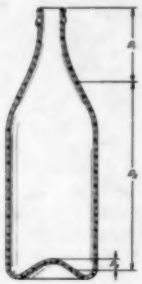
Kjell M. Jacobsen, Hjallese, Denmark, assignor to PLM Aktiebolag, Malmo, Sweden

Division of Ser. No. 22,320, Mar. 20, 1979, Pat. No. 4,264,558, which is a continuation of Ser. No. 831,785, Sep. 9, 1977, abandoned, which is a continuation of Ser. No. 614,430, Sep. 18, 1975, abandoned. This application Oct. 14, 1980, Ser. No. 196,373

Claims priority, application Sweden, Sep. 24, 1974, 7411960

Int. Cl.³ B65D *23/00*

U.S. Cl. 215—1 C 7 Claims



1. A form-retaining container made of a thermoplastic polymer material selected from the group consisting of polyethylene terephthalate, polyhexamethylene adipamide, polycaprolactam, polyhexamethylene sebacamide, polyethylene 2,6 and 1,5 naphthalate, polytetramethylene-1,2-dioxybenzoate, and copolymers of ethylene terephthalate and ethylene isophthalate; said container comprising in succession a mouth, a neck, a main body portion, and a bottom including a central portion and a peripheral portion, said container having a first region inclusive of said mouth and part of said neck, a second region inclusive of the remainder of said neck, said main body portion and said peripheral portion of said bottom, and a third region constituted by said central portion of said bottom, said polymer material being selectively heated, cooled and inflated so that said second region is obtained by stretching said material in said second region in more than one direction to achieve biaxial stretching and orientation of the material while the material in said first and third regions is substantially unoriented, whereafter the material is treated at a temperature above the crystallization temperature, while being internally pressurized to effect thermal crystallization and release of internal stresses of said regions such that the first and third regions are in a thermocrystallized state and provide an opaque appearance while the second region has only a small crystallization to provide a transparent appearance, whereby the container is form stable when reheated to a temperature above the glass transition temperature of the material.

4,387,816

COLLAPSE RESISTANT CONTAINER

Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 18, 1982, Ser. No. 340,567

Int. Cl.³ B65D *1/02*

U.S. Cl. 215—1 C 10 Claims

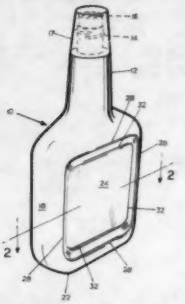
1. A unitary container made from an organic thermoplastic material comprising:

an upstanding neck portion terminating in a finish portion defining an opening into said container;

a pair of spaced apart sidewall panels connected to and depending downwardly from said neck portion;

a bottom portion connected to said spaced apart sidewall panels and providing a base for said container; and

a pair of spaced apart label panels connected to said neck portion, said sidewall panels and said bottom portion to thereby define an enclosed volumn for said container,



each of said label panels including a centrally located collapsible label area, a peripherally located, upstanding rim portion and a flexible hinge portion inward of and adjacent to said upstanding rim portion and extending around the entire intersection of said upstanding rim portion and said collapsible label area.

4,387,817

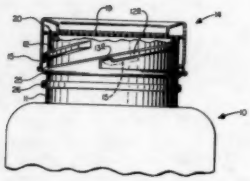
CHILD RESISTANT CONTAINER COVER

Laurence E. Wiles; Frank C. Page, III, both of Cheshire, and Bruno A. Eibensteiner, Waterbury, all of Conn., assignors to Ethyl Products Company, Richmond, Va.

Continuation-in-part of Ser. No. 161,130, Jun. 19, 1980, abandoned. This application Oct. 19, 1981, Ser. No. 312,804

Int. Cl.³ B65D *55/02*

U.S. Cl. 215—217 **34 Claims**



1. A child-resistant package comprising a closure and container, said package characterized by:

a. said container having a threaded neck portion;

b. said closure being provided with a multiplicity of threads having arrowhead-shaped portions on one end thereof;

c. means connected to said threaded neck portion for stopping the threading rotation of said closure onto said threaded neck portion at a predetermined position, said means including a gap in at least two of said threads on said neck portion adapted for receipt of said arrowhead-shaped portion therein, said gap being defined by

i. a raised stop at the end of at least two of said threads on said neck portion against which the end of at least two of said threads on said closure strikes when said closure is threaded onto said neck portion, and

ii. the end of said threads on said neck portion; and

d. resilient liner means interposed between the underside of the top of said closure and the top of said neck portion.

4,387,818

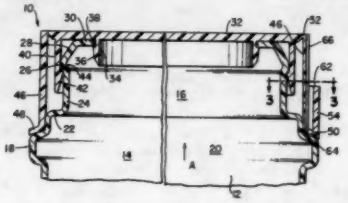
SNAP-ON TAMPER-PROOF CLOSURE

Vincent N. Conti, West Hempstead, N.Y., assignor to Itnoc Dairy Cap Co. Inc., Jamaica, N.Y.

Filed Nov. 7, 1980, Ser. No. 204,858

Int. Cl.³ B65D *41/46*

U.S. Cl. 215—256 **10 Claims**



1. A snap-on cap for use with a container having a neck and a mouth defining an upper opening communicating with the interior of the container, the neck having an annular ring extending therearound and positioned below the mouth, comprising:

(a) a top wall configured and diminished such that at least a portion of said top wall is capable of contacting at least an uppermost outer surface portion of said container mouth so as to seal the container mouth;

(b) a first annular sealing wall extending downwardly from said top wall, said first annular sealing wall having an outer configuration capable of snap-fitting sealing engagement with at least an inner surface portion of the container mouth;

(c) a second annular sealing wall extending downwardly from said top wall and being spaced radially outwardly from said first annular sealing wall and inwardly from the periphery of said top wall, said second annular sealing wall having an inner configuration capable of snap-fitting sealing engagement with at least an outer surface portion of the container mouth; and

(d) an outer wall extending downwardly from the periphery of said top wall a greater length than said second annular sealing wall, said outer wall being easily separable from said top wall so as to provide evidence of unauthorized tampering with said snap-on cap.

4,387,819

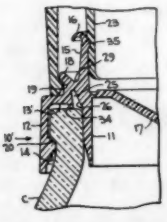
SEALING MEANS FOR A SNAP-ON FITMENT

Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045

Filed Dec. 23, 1981, Ser. No. 333,749

Int. Cl.³ B65D *47/14*

U.S. Cl. 215—273 **9 Claims**



1. Sealing means for a snap-on fitment, comprising a body member having spaced apart inner and outer skirts engageable with opposite sides of the neck of a container, an annular wall interconnecting said skirts and overlying a terminal end of the container neck, an extension provided on said annular wall forming a tubular engaging portion and having an inner sealing

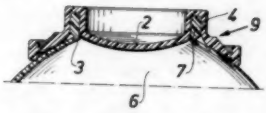
surface, and an outwardly extending annular snap bead on said wall to facilitate a snap fit for the fitment, said wall having an annular relieved section therein adjacent said inner skirt and opening into the space between said skirts, said relieved section having opposed side walls and a bottom wall, one of said side walls forming an extension of the outer surface of said inner skirt, said bottom wall extending radially outwardly from said engaging portion, an outer surface of said interconnecting wall defining a first wall section with said bottom wall, said annular wall including a second wall section spaced apart from said first wall section and extending inwardly from said outer skirt, said snap bead extending from an outer end of said first wall section, whereby any distortions imposed on said snap bead and on said sealing surface as occasioned by any dimensional and/or shape irregularities in the container neck are reduced by the relief between inner and outer engagements with the container neck thereby resulting in an isolation of any distortions of said skirts relative to one another, an isolation of any outer skirt distortion relative to said snap bead, an isolation of any inner skirt distortion relative to said sealing surface and the maintenance of dimensional stability between said snap beam and said sealing surface.

4,387,820

CLOSING ARRANGEMENT FOR PACKING CONTAINERS

Rolf L. Ignell, Grilly Divonne-les-Bains, France, assignor to Tetra Pak Developpement SA, Pully-Lausanne, Switzerland

Filed Jul. 2, 1981, Ser. No. 279,945
Claims priority, application Sweden, Jul. 16, 1980, 8005182
Int. Cl.³ B65D *41/02*
U.S. Cl. 215—320 **10 Claims**



1. A closure cap for a packing container of the type which has a flanged mouth portion, said cap comprising:

a cap body of flexible material;

a jacket integral with said body and cooperating therewith to form a channel for receiving the flanged mouth portion of a container;

a plurality of levers spaced around said jacket and integral with said jacket, said levers each including a first lever arm positioned to engage under said flanged mouth portion when said levers are lowered and positioned out of engagement with said mouth portion when said levers are raised, each of said levers further including:

first pivoting means around which said lever is pivotable, said first lever arm being disposed on a first side of said first pivoting means and said first lever arm cooperating with the flanged mouth portion of the packing container,

a second lever arm disposed on a second side of said first pivoting means, said second lever arm serving as a stiffening element, and

second pivoting means around which said lever is pivotable; and

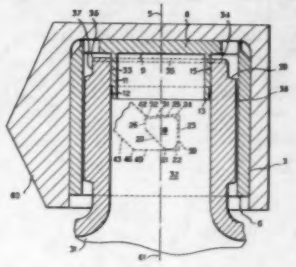
ring means for moving said levers in unison between said lowered and raised positions, said second pivoting means joining each of said levers to said ring means.

4,387,821

STOPPING DEVICE FOR BOTTLE

Reinold Geiger, Neuilly, France, assignor to A.M.S. (Ateliers de Moulage Specialise), Saint-Ouen, France

Filed Dec. 3, 1980, Ser. No. 212,440
Claims priority, application France, Dec. 20, 1979, 79 31317
Int. Cl.³ B65D *41/06*
U.S. Cl. 215—330 **12 Claims**



1. A stopping apparatus for a bottle having a neck portion formed with a cylindrical throat in a body without symmetry of revolution, said stopping apparatus comprising:

(a) a cylindrical hollow body, one end of which is open, the other end having a radial end wall;

(b) a stopper cap devoid of rotational symmetry;

(c) a cylindrical elastic skirt extending substantially perpendicular to and downwardly from the inner surface of said radial end wall, said cylindrical elastic skirt being positioned concentrically with said radial end wall and being adapted to seal the cylindrical throat of the bottle;

(d) at least one protrusion extending radially inwardly from the inner wall of said cylindrical hollow body;

(e) an annular ring, said annular ring having an upper radially extended edge portion adapted to be spaced downwardly from the upper end of the neck portion of the bottle, said upper radially extended edge forming a bearing surface for slidably receiving the lower end of said at least one protrusion;

(f) at least one groove formed in said annular ring and bordered by radial edges, one end of said groove interrupting said radially extended edge of said annular ring, the other end of said groove opening into a lodging adapted to receive and hold at least one protrusion of said cylindrical hollow body;

(g) two diametrically opposed protrusions extending radially inward from the inner wall of said cylindrical hollow body; and

(h) two diametrically opposed grooves adapted to receive, respectively, said two protrusions;

whereby when said stopping apparatus is placed concentrically on the neck portion of the bottle so that the lower end of said at least one protrustion abuts said radially extended edge portion of said annular ring whereby upon rotation of said stopping apparatus, said at least one protrusion is inserted into said at least one groove formed in said annular ring, said radial edges of said at least one groove cooperating with said at least one protrusion to introduce said at least one protrusion into said lodging thereby sealing said bottle when said stopper cap has a predetermined orientation relative to the bottle; and

wherein each of said protrusions comprises a prismatic lug having a convex polygonal periphery, each lug having an inwardly facing surface substantially concentric with the inner surface of said cylindrical hollow body, at least one upper facet, at least one lower facet and at least one planar facet facing into the direction of rotation for closure, said at least one planar facet extending substantially parallel to

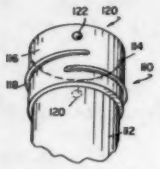
the axis of rotation of said stopping apparatus and said upper and lower facets extending substantially perpendicular thereto.

4,387,822

CONTAINER AND CLOSURE ASSEMBLY HAVING INTERMEDIATE POSITIONING MEANS

Robert W. Lynn, Oxnard, Calif., assignor to Becton, Dickinson and Company, Paramus, N.J.

Division of Ser. No. 84,883, Oct. 15, 1979, Pat. No. 4,289,248.
This application May 11, 1981, Ser. No. 262,079
Int. Cl.³ B65D 41/04
U.S. Cl. 215—330 1 Claim



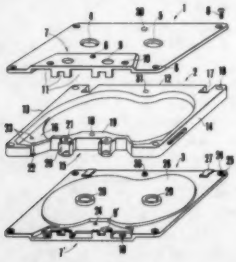
1. In combination, a container having an open neck portion formed with threadable engaging means and a removable closure formed with mating threadable engaging means, said closure including an end covering said neck portion for sealing said container closed, at least one projection on said neck portion, at least one protuberance on the wall of said closure, said projection being shaped to allow said protuberance to pass thereover in either direction when said closure is threaded on or off of said neck portion, said projection being formed above said threadable engaging means, said protuberance requiring an applied force to enable same to pass over said projection so that said closure can be partially unthreaded from said neck portion but yet remain connected thereto.

4,387,823

MAGNETIC TAPE CASSETTE

Haruo Shiba, Sakushi, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,884
Claims priority, application Japan, Mar. 25, 1980, 55-38215[U]
Int. Cl.³ B65D 6/00; G03B 1/04; G11B 15/32
U.S. Cl. 220—4 R 15 Claims



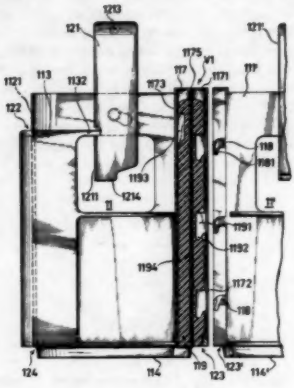
1. A magnetic tape cassette including an intermediate frame having flat upper and lower parallel surfaces providing sufficient space therein to hold a length of magnetic tape, and substantially flat top and bottom plates fastened, respectively, to the flat upper and lower surfaces of the intermediate frame, characterized in that said intermediate frame comprises a composite resin material containing an unsaturated polyester resin and a thermoplastic polymer containing from 50 to 75% by weight of calcium carbonate and glass fiber on the basis of the total resin weight.

4,387,824

DIVIDABLE BOTTLE CONTAINER

Werner Wefers, Dortmund, Fed. Rep. of Germany, assignor to Peter Cremer, Dortmund, Fed. Rep. of Germany

Filed Oct. 7, 1981, Ser. No. 309,176
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034650
Int. Cl.³ B65D 21/02
U.S. Cl. 220—23.4 8 Claims



1. A two-part synthetic bottle container, comprising: an outer wall; a division wall extending parallel to said outer wall, dividing elements and interengaging locking elements in form of a plurality of hooks projecting in the region of one corner of an abutment surface past the dividing elements, said locking elements having recesses located in the region of the other corner and corresponding to the hook cross-section, a slider having surface portions which in a locking position extend behind hooks of a corresponding container part, carrying brackets pivoted with pivot means on parts of the container at narrow sides thereof, and pivotable relative to the container parts, said carrying brackets having free end projecting past said pivot means, said carrying brackets having an abutment at the free end thereof; said carrying brackets, when pivoted against the container parts, extending with said abutment through a recess in the wall of a corresponding locking compartment and engaging in a recess in said slider to lift said slider to a latching position.

4,387,825

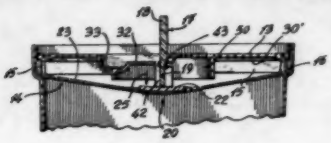
CONTRACTABLE CLOSURE MEMBER

Daniel Parent, St-Hyacinthe, Canada, assignor to Produits Menagers Coronet (1980) Inc., Quebec, Canada

Continuation-in-part of Ser. No. 128,452, Mar. 10, 1980, Pat. No. 4,295,578. This application Aug. 17, 1981, Ser. No. 293,307
The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.
Int. Cl.³ B65D 53/00
U.S. Cl. 220—234 17 Claims

1. A contractable closure member for sealing an open-ended container, said closure member comprising a top wall, a bottom wall formed from an elastic material and having an integral continuous side wall, seal means in said side wall, said side wall being securable to said top wall with said bottom wall held in spaced relationship therewith, a retracting lever pivotally secured below said top wall and having an engagement end and a pusher end, said pusher end being arcuately displaceable against a central portion of said bottom wall to distend

said bottom wall whereby at least a portion of said side wall will be drawn inwardly to remove sealing pressure by said seal



means when said closure member is positioned for sealing engagement with an open-ended container.

4,387,826

CLOSURE FOR CANS PROVIDED WITH BEADED EDGE

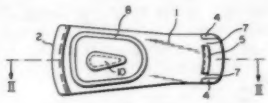
Walter Heubl, Bergstr. 7, 8901 Aystetten, Fed. Rep. of Germany

Filed Jul. 31, 1981, Ser. No. 288,700

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1980, 8020985[U]; European Pat. Off., Jul. 21, 1981, 81105748.8

Int. Cl.³ B65D *45/00*

U.S. Cl. 220—243 **11 Claims**



1. A closure device for cans having a beaded edge and a cover having a pouring opening formed by removal of a tear-off portion thereof, said closure device comprising:

a unitary synthetic resin elongated planar body having a length at least as great as the diameter of said can;

an edge web formed at one end of said body and having a curvature equal to the curvature of said beaded edge, said edge web being formed with an inwardly projecting flange for gripping the underside of said beaded edge;

a tensioning element formed at the other end of said body opposite said edge web and spaced therefrom at a distance substantially equal to the diameter of said beaded edge, said tensioning element having a formation adapted to engage the underside of said beaded edge and being deflectable for releasing same;

a flat extension formed on said body beyond said tensioning element and projecting over said edge of said can;

a pair of rigid formations on said body spaced to either side of said tension element and engaging the outer periphery of said beaded edge to cause tension between said rigid formations and said first mentioned edge web; and

a seal mounted on said body and adapted to engage said cover around said opening.

4,387,827

CONTAINER CLOSURE

John Ruemer, Jr., Baltimore, Md., assignor to Crown Cork & Seal Company, Incorporated, Philadelphia, Pa.

Filed Nov. 27, 1981, Ser. No. 325,462

Int. Cl.³ B65D *17/34*

U.S. Cl. 220—269 **5 Claims**

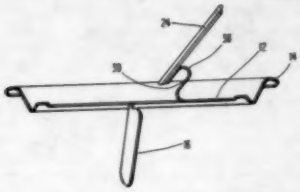
1. In an end closure of the type having a wall with a peripheral edge;

a pour opening panel in said wall, said panel being defined by a primary score line, said primary score line circumscribing said pour opening panel except at a hinge area;

an opening tab attached to said wall at a fulcrum adjacent said primary score line, said opening tab having a handle portion and a forward portion, said forward portion being adapted to depress said pour opening panel to expose a pour opening when said opening tab is pivoted about said fulcrum; and

a fastening means at said fulcrum for securing said opening tab to said wall, the improvement comprising:

one secondary score line contiguous with the said primary score line and projecting away from said pour opening panel, said one secondary score line being adjacent to said fulcrum on one side of said fastening means;



another secondary score line contiguous with said primary score line and projecting away from said pour opening panel, said another secondary score line being adjacent said fulcrum on the other side of said fastening means, said one and said another secondary score lines defining a means for retracting said opening tab from said pour opening after said pour opening panel has been depressed.

4,387,828

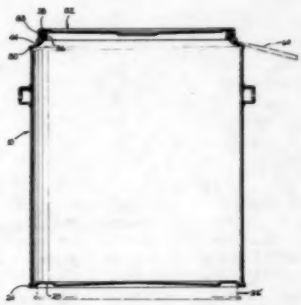
PLASTIC CONTAINER AND LID

George Yates, Jr., 151 Cumberland Rd., Glendale, Calif. 91202

Continuation of Ser. No. 120,717, Feb. 11, 1980, abandoned. This application Oct. 2, 1981, Ser. No. 307,807

Int. Cl.³ B65D *41/18*

U.S. Cl. 220—284 **3 Claims**



1. A plastic container and detachably disposed lid in combination,

(a) said container including a middle section having a cylindrical shape with a generally constant wall thickness; a bottom section integral with said middle section and including a projection defining the bottom part of said middle section;

an upper section integral with said middle section and including a projection defining the top part of said middle section wherein said middle section and the first and second mentioned projections are congruent with the outer dimensions of the wall and the location of the upper and lower beads of a conventional one-gallon metal paint container; said upper section also includes an integral neck having a wall portion directed upwardly and inwardly and a straight vertical wall portion in which the inner surface of the vertical wall portion is cylindrical having no projections, recesses or

slanted surfaces, said neck terminating with an annular bead, wherein said upwardly and inwardly directed wall portion and said vertical wall portion have a constant wall thickness of approximately the same dimension as the wall thickness of said middle section; and

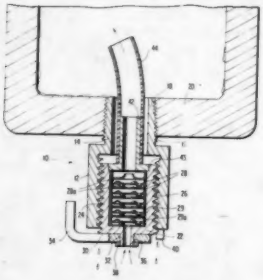
(b) said lid having an annular, generally flat surface, a recessed middle portion, and a perimetral flexible leg including an internal lip for engaging the bead of said upper section, said lid when placed on the container being disposed such that the end of the leg at the lowest portion of the lid is spaced above and substantially inwardly of the projection defining the top part of the middle section so that the major portion of said upwardly and inwardly directed wall portion below said leg is viewable when viewing said upwardly and inwardly directed wall portion in a horizontal plane when said container is in an upright position, said projection of said upper section serving as a fulcrum for a tool used to remove the lid from the container by inserting an end of the tool under the leg and pivoting the tool at the projection, said leg being spaced from said vertical wall portion below the engagement of said internal lip and said bead with the spacing gradually increasing as the distance from said engagement increases.

4,387,829

COMBINATION BREATHER-DRAIN

Richard C. Berry, Camillus, N.Y., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jan. 6, 1982, Ser. No. 337,555
Int. Cl.³ B65D *51/16*
U.S. Cl. 220—374 **7 Claims**



1. A combination breather-drain comprising hollow cylindrical plug means having external threads for threaded engagement with a threaded aperture in the bottom wall of an explosion proof housing, said threaded engagement having sufficient clearance to allow the passage of water therethrough and a sufficient number of turns to render the threaded connection explosion proof and air passage means located within said hollow cylindrical plug means permitting the passage of air from the exterior of the housing to the interior of the housing while maintaining said housing explosion proof.

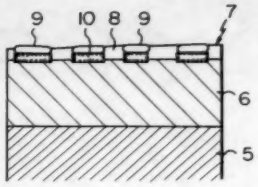
4,387,830

SIDE SEAM-COATED TINPLATE WELDED CAN

Yoichi Kitamura; Seishichi Kobayashi, both of Yokohama, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jun. 5, 1981, Ser. No. 271,238
Claims priority, application Japan, Jun. 12, 1980, 55-78347
Int. Cl.³ B65D *7/34*
U.S. Cl. 220—456 **8 Claims**

1. A welded tinplate seam can having a side seam formed by welding, wherein the inner and outer surface portions of said side seam comprise an outermost layer formed of an oxide, which has a thickness of 50 to 400 Å, and an intermediate layer formed mainly of an iron-tin alloy layer, which has a thickness corresponding to 5 to 100% of the thickness of the total tin layer, and a resin or resin composition containing a polar group selected from the group consisting of carbonyl, hydroxyl,



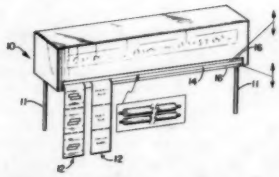
ether and epoxy groups at a concentration of 10 to 2000 millimoles per 100 g of the resin is coated on at least one of said inner and outer surface portions of said side seam.

4,387,831

CONTAINER FOR DISPENSING ARTICLES CARRIED ON A WEB

John F. McNally, 60 Venetian Dr. N101, Delray Beach, Fla. 33444, assignor to Claire O. McNally, Delray Beach, Fla.

Filed Dec. 17, 1980, Ser. No. 217,552
Int. Cl.³ B65H *5/28*
U.S. Cl. 221—25 **6 Claims**



1. An improved point-of-sale article display and dispensing device for small easily pilfered articles comprising

an elongate boxlike receptacle having a front wall available for the display of promotional material,

means for mounting said receptacle at a predetermined elevation above and closely adjacent a checkout counter at a retail store,

an elongate article delivery slot in the lower portion of said front wall of said boxlike receptacle to effect article delivery without impairment of visual access to said front wall,

a plurality of article storage and dispensing containers sized to be removably disposed in side-by-side relation within said boxlike receptacle for point of sale presentation of variegated articles,

each of said article storage and dispensing containers containing an elongate web having a series of articles to be dispensed mounted in longitudinal spaced relation thereon and an aperture adjacent one corner thereof for progressive lineal removal of said article supporting web therefrom,

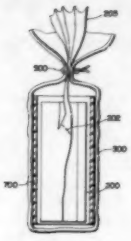
said apertures in said article storage and dispensing containers being selectively located for disposition in aligned abutting relationship with the article delivery slot in said boxlike receptacle when said article storage and dispensing containers are disposed in operative article dispensing relation therewithin, and resiliently deformable means associated with said elongate delivery slot in said receptacle for selectively compressively engaging said article supporting webs to resiliently restrain web passage therethrough.

4,387,832

PRE-MOISTENED TOWELETTE DISPENSING PACKAGE INCLUDING FLEXIBLY ADJUSTABLE TIE DEVICE

Herman Margulies, South Orange, N.J., assignor to Sterling Drug Inc., New York, N.Y.

Filed Feb. 24, 1981, Ser. No. 237,585
Int. Cl.³ A47K *10/38*
U.S. Cl. 221—63 **9 Claims**



1. A package for dispensing and separating single sheets from a continuous web of pre-moistened sheets, said package comprising:

a continuous web of pre-moistened sheets which are joined at perforations;

bag means surrounding the web and being open at a top end portion thereof, and an end sheet of the web extending through the open top end portion; and

flexible tie means surrounding the end sheet of the web and the top end portion of the bag means, the tie means gathering and substantially sealing the top end portion of the bag means around the end sheet of the web and forming a dispensing opening at the top end portion of the bag means for dispensing the end sheet therethrough, the tie means providing sufficient friction at the dispensing opening between the top end portion of the bag means and the web to cause the end sheet of the web to automatically tear above the dispensing opening from the next sheet of the web at the perforations therebetween when the end sheet is drawn through the dispensing opening, the tie means being accessible to be flexibly adjustable to enable selective alteration of the size of the dispensing opening at the open top end portion of the bag means and selective adjustment of the friction.

4,387,833

APPARATUS FOR CONTAINING AND DISPENSING FLUIDS UNDER PRESSURE AND METHOD OF PRODUCING SAME

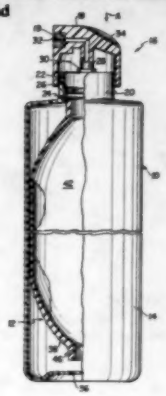
Frank Venus, Jr., Merrimack, N.H., assignor to Container Industries, Inc., Londonderry, N.H.

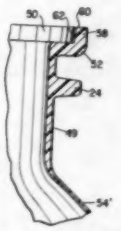
Filed Dec. 16, 1980, Ser. No. 216,191
Int. Cl.³ B65D *37/00*
U.S. Cl. 222—95 **46 Claims**

1. An apparatus for containing and dispensing a fluid medium under pressure comprising:

(a) substantially inert flexible means defining an inner region for containing the fluid medium under pressure and capable of being folded about one axis in its empty condition and expanded at least in directions substantially transverse to said axis when filled with the fluid medium under pressure, said substantially inert flexible means having relatively rigid means integral therewith for connecting valve means thereto;

(b) a resilient tubular member positioned so as to extend at least over the length of said substantially inert flexible means and being expandable in directions substantially transverse to said axis when said flexible container means is filled with the fluid medium under pressure such that frictional interaction between said substantially inert flexible means and said resilient tubular member at least in longitudinal directions prevents substantial elongation of said resilient tubular member when said substantially inert flexible means is filled with the fluid medium under pressure but permits expansion of said resilient tubular member in radially outward directions substantially uniformly along its length; and





(c) valve means connected to said valve connecting means and adapted to substantially prevent evacuation of said flexible container means under normal conditions and capable of selectively providing communication between said inner region of said flexible container means and the outside atmosphere thereby to permit selective amounts of the pressurized fluid medium to exit said flexible container due to the generally inward forces provided by said resilient member in its generally expanded condition.

4,387,834

COMBINATION THERMOPLASTIC AND GLASS LOADED THERMOSETTING INJECTION MOLDING MACHINE AND METHOD FOR OPERATING SAME

Thomas G. Bishop, Mount Gilead, Ohio, assignor to HPM Corporation, Mount Gilead, Ohio

Division of Ser. No. 80,486, Oct. 1, 1979, Pat. No. 4,280,972.
This application Oct. 20, 1980, Ser. No. 199,077
Int. Cl.³ G01F *11/00*
U.S. Cl. 222—278 **7 Claims**

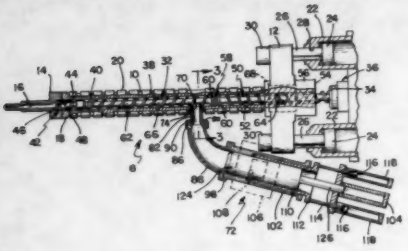
5. An injection molding machine comprising:

an elongate barrel having a generally cylindrical bore therein, said barrel having a forward end and a rear end and a side wall,

an elongate screw rotatably and axially reciprocably received within the bore of said barrel,

a first feed opening near the rear end of said barrel extending into the bore through the side wall,

a second feed opening intermediate the first feed opening in the forward end of the barrel extending into the bore through the barrel side wall, and



a plug means attachable to said barrel for alternatively closing and opening said second feed opening, said plug means being insertable into said second feed opening and including a concave inner surface contoured to conform to said bore.

4,387,835

BICYCLE PANNIER

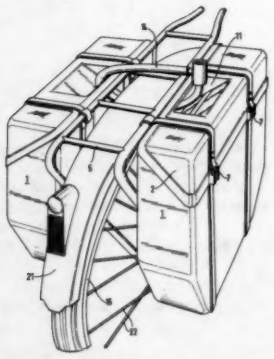
Siegbert Gölzer, Am Mühlberg 30, D-6780 Pirmasens, Fed. Rep. of Germany

Filed Apr. 2, 1981, Ser. No. 250,382

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1980, 3013593

Int. Cl.³ B62J *9/00*; **B65D** *25/30*

U.S. Cl. 224—37 A **10 Claims**



1. A bicycle pannier adapted to be securably fastened to the luggage rack of a bicycle, said pannier having a container open at the top end thereof and a lid hinged to said container and adapted to sealably enclose the top end thereof, wherein said container and said lid each include complimentary oblique passages adapted to permit a locking ring to be inserted

therethrough for locking said lid in a closed position to said container, for locking said pannier to a wheel of said bicycle and for locking the wheel itself, said container having a front wall and a rear wall opposed thereto adapted to be positioned adjacent the bicycle, said rear wall extending higher than said front wall with the top end of the connecting side walls sloping downwardly from said rear wall to said front wall, said lid having a substantially horizontal top wall, a substantially vertical forward wall adapted to be substantially aligned with said front wall, and sides interconnecting the top and forward walls, said lid being attached to said container at the bottom of said forward wall to said front wall, the bottom edge of said sides sloping downwardly from said top wall to said forward wall when said lid closes said top end of the container to correspondingly mate with said sloping walls of said container, the oblique passage of said container extending at a slope upwardly from said rear wall and the oblique passage of said lid extending at a slope downwardly from said top wall to correspondingly mate with said oblique passage of said container.

4,387,836

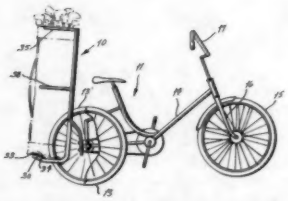
GOLF BAG CARRIER

Daniel A. Laesch, 212 Greenwood Ave., R R. 7, Bloomington, Ill. 61701

Filed Jul. 9, 1981, Ser. No. 281,888

Int. Cl.³ B62J *7/02*

U.S. Cl. 224—32 A **6 Claims**



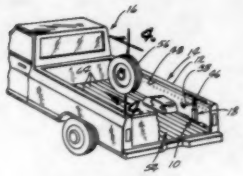
1. A golf bag carrier for an adult-style pedal cycle or the like having a pair of rear wheels connected by a pedal-driven axle and having at least one axle housing, characterized by said carrier comprising at least one elongated, generally upright main frame member, said main frame member being of L-shape having an upstanding rectilinear portion for lying adjacent said bag and a rearwardly extending supporting portion for extending under and supporting said bag, means carried at an outer end of said rearwardly extending portion for defining a pedestal for supporting the weight of a golf bag, and a plurality of lateral support members carried upward from said pedestal for laterally securing said golf bag, said lateral support members extending laterally with respect to said rectilinear portion for surroundingly cradling said bag, said lateral support members having horizontal rectilinear portions and arcuate terminal portions for extending around the sides of said golf bag, and frame support members interconnected with said lateral support members including lower ends remote from said lateral support members for securement to said cycle, said frame support members each including a rectilinear portion parallel to and substantially co-extensive with the rectilinear portion of said main frame member and located on a respective side thereof and interconnected with the horizontal rectilinear portions of said lateral support members, said frame support members each including an offset portion extending forwardly toward said axle housing and with said lower end extending below said offset portion, each said offset portion providing offset mounting of said golf bag rearwardly of said axle housing, and clamp means at the lower ends of each of the offset portions of said frame support members for clampingly engaging said axle housing, and said clamp means engaging said rear axle housing for locating said main frame therebehind with said rectilinear portion angled slightly forward with respect to vertical.

4,387,837

VEHICLE SPARE TIRE CARRIER

Marvin K. Carr, and Cheryl D. Smith, both of Hampton, Iowa, assignors to Diane Kenneth Ltd., Hampton, Iowa

Filed Aug. 24, 1981, Ser. No. 295,703
Int. Cl.³ B65D 43/08
U.S. Cl. 224—42.21 4 Claims



1. In combination with a vehicle having a box including a floor, an adjacent sidewall and a ledge extending horizontally inwardly from said sidewall and spaced over said floor and including a downwardly extending flange inwardly spaced from said sidewall, said floor including an outwardly facing shoulder in adjacent spaced relation from said sidewall and a generally horizontal portion between said shoulder and sidewall, a tire carrier comprising,

a vertically disposed frame member including a pair of telescopically extendable channel portions and means for selectively locking said portions together at a desired length to provide said frame member with rigidity,

an elongated head means on the upper end of said frame member including forwardly and rearwardly extending horizontally disposed head elements positioned between said downwardly extending flange and said sidewall to distribute the pressure on said flange over an area thereof,

said head elements having opposite ends laterally offset, towards said flange, from a central portion of the elongated head means and sleeve means extending over said ends to provide cushioned engagement between said flange and said head ends,

an elongated foot means on the lower end of said vertically disposed frame member including forwardly and rearwardly extending horizontally disposed foot elements with cushion sleeve means extending over said foot elements, said sleeve means engaging said horizontal portion of the floor and the outwardly facing shoulder thereof to distribute the pressure on said floor over an area and to increase the friction between said foot elements and said floor, said head elements and foot elements thereby cooperating to give the carrier stability against both rotational and inward displacement, and

bolt means connected to said frame member medially thereof and extending laterally inwardly into engagement with the wheel of a tire with said tire engaging at its lower end said floor and its outer side engaging the inner side of said flange whereby said flange is clamped between said tire and said head means.

4,387,838

GLOVE-MOUNTED WRIST WATCH

Patrick L. Jackson, 4211 Forest Rd., St. Louis Park, Minn. 55416

Filed Sep. 18, 1981, Ser. No. 303,201
Int. Cl.³ A44C 5/14; A41D 19/00
U.S. Cl. 224—170 7 Claims

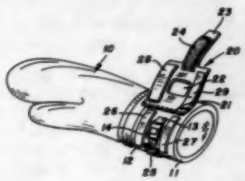
1. In combination:

a garment including a gauntlet wrist portion having a wrist watch receiving area;

a pair of spaced members secured to the outer surface of said gauntlet at opposite sides of said area for receiving the telescopic bracelet pins of a wrist watch, whereby to secure a wrist watch in said area;

a flap, having a central observation aperture smaller than the face of a wrist watch, secured to said gauntlet to fold over a wrist watch, secured in said area by pins in said members, so that said observation aperture may become aligned with said area to enable observation of a watch therein;

a first plurality of strips of resilient material secured to said gauntlet to abut said area;



a second plurality of strips of resilient material secured to the inside of said flap to engage the strips of said first plurality when said flap is folded, for closely surrounding a watch in said area, the combined thickness of said straps being less than the thickness of a watch so that when said flap is folded, the rim of said aperture may engage the face of a watch in said area to prevent the passage of undesired matter into said area;

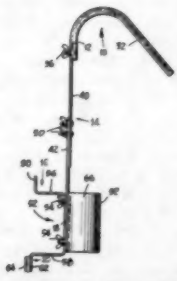
and further means secured to said gauntlet and said flap for holding said flap in folded position over said area.

4,387,839

DRUM SUPPORTING HARNESS

John S. Dranchak, 15 Jog Hill Rd., Trumbull, Conn. 06611

Filed May 29, 1981, Ser. No. 268,568
Int. Cl.³ G10G 5/00
U.S. Cl. 224—265 10 Claims



1. As a new article of manufacture, a harness intended to be worn by a marching drummer for supporting a drum of the type having on the outside of its body a spaced, horizontal hanger strip, said harness comprising in combination:

(a) a pair of shoulder hooks adapted to rest on the shoulders of the drummer,

(b) a breast plate secured to and extending between said shoulder hooks at the chest of the drummer, said breast plate maintaining a predetermined spacing between the shoulder hooks,

(c) a hanger structure attached to the breast plate and depending therefrom,

(d) upwardly-facing hook means comprising a horizontal leg having a vertical bill portion extending upward from the end of the leg, said hook means being carried by the lower portion of the hanger structure and being adapted to fit

under the hanger strip on the drum and the bill portion thereof being adapted to extend upward in the space between the drum body and the hanger strip,

(e) a spacer bar extending downward from the hook means, and

(f) a spacing leg carried by the lower end of the spacer bar and extending forwardly therefrom, having an abutment at its forward end, said abutment being spaced from the spacer bar and adapted for engagement with a side wall of the drum to maintain the latter in playing position while being supported by said hook means,

(g) all portions of the abutment on the spacing leg being disposed forwardly with respect to the hook means.

4,387,840

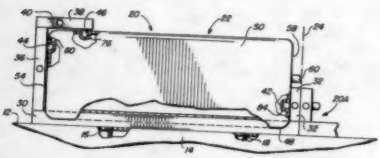
VEHICLE WITH IMPROVED LUGGAGE AND RACK ASSEMBLY

Harry V. Popeney, 18136-45 Oxnard St., Tarzana, Calif. 91356

Filed Dec. 10, 1981, Ser. No. 329,288

Int. Cl.³ B60R 9/04

U.S. Cl. 224—314 **8 Claims**



1. A vehicle with an improved luggage and rack assembly, said vehicle comprising, in combination:

(a) a vehicle having a generally flat horizontal luggage support portion;

(b) a luggage retainer sub assembly, said sub assembly comprising

i. a spaced parallel pair of substantially horizontal rails secured to the upper surface of said luggage support portion,

ii. a first end plate disposed between and hinged to one end of said pair of rails, and movable between an operative, about vertical, luggage support position and a collapsed stored position between said rails,

iii. a second end plate disposed between and hinged to the opposite end of said pair of rails and including a first section movable between a collapsed stored position between said rails and an operative, about vertical, luggage support position, and a second section hinged by connecting to the free end of said first section and movable between a collapsed stored position between said rails and an operative, about horizontal, luggage support position spaced above said rails and about perpendicular to said first section, said first and second plates defining a space therebetween and including detents facing said space; and,

c. an item of luggage having a top, bottom and sides disposed in said space and defining a hollow closed interior, said bottom including a groove releasably receiving said pair of rails, and said top and two opposite sides defining recesses releasably receiving said detents, whereby said luggage is releasably secured in said assembly.

4,387,841

FILM DIVERSION APPARATUS

William E. Hawkins, Circleville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

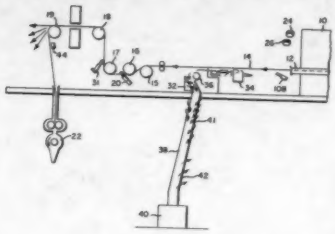
Filed Mar. 20, 1981, Ser. No. 252,520

Int. Cl.³ B65H 17/32

U.S. Cl. 226—97 **8 Claims**

4. In a machine including equipment for transferring film through a path of advance to a windup, an apparatus for diverting broken film, said apparatus comprising:

an elongated, hollow element having a tubular surface and a slot-jet opening onto said surface, said element being located beneath and adjacent said path with the slot-jet extending transversely through the width of the path;



a waste collector beneath said element; and

means mounting said element for rotation about its axis between a normal first position in which the slot-jet is directed along said path and a second position in which it is directed toward the waste collector.

4,387,842

BULK MATERIAL HANDLER AND FEEDER

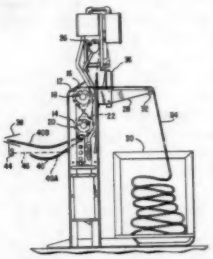
Samuel B. Stevens, Pekin, and James R. Lytle, Sr., Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00350, § 371 Date Mar. 31, 1980, § 102(e) Date Mar. 31, 1980, PCT Pub. No. WO81/02879, PCT Pub. Date Oct. 15, 1981

PCT Filed Mar. 31, 1980, Ser. No. 245,552

Int. Cl.³ B65H 17/42, 25/00

U.S. Cl. 226—113 **18 Claims**



4. A handler (10) for directing and feeding strip material (34) to subsequent processing operations, a support (38) horizontally spaced from said handler (10), said handler comprising:

a frame (16);

upper and lower rollers (12,12',14) mounted on and vertically spaced along said frame (16) such that said rollers (12,12',14) are separated a distance greater than the thickness of said material (34); and

means (22,24,20) for rotating the lower of said rollers (14);

means (18) for rotating the upper roller (12) simultaneously with the lower roller (14), said lower roller (14) rotated faster than the upper rollers (12);

said strip material (34) being around the upper roller (12,12') in a direction toward said support (38), between said rollers (12,12',14), around said lower roller (14) in a direction away from said support (38), and to said support;

said strip material (34) and said lower roller (14) being frictionally engaged along an arc sufficient to maintain driv-

ing force on said material (34) as said material is fed toward said support (38);

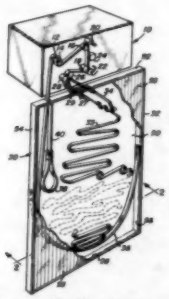
said material (34) being driven toward said support (38) at a higher rate than said material is removed from said support by said subsequent processing operations thereby producing a depending loop (40) of material (34) between said lower roller (14) and said support (38).

4,387,843

LOOP BIN FOR MAGNETIC TAPE RECORDING APPARATUS

George D. Rehklau, Los Altos, Calif., assignor to Electro-Sound Inc., Sunnyvale, Calif.

Filed May 5, 1980, Ser. No. 146,295
Int. Cl.³ B65H *17/42*; G11B *15/56*
U.S. Cl. 226—118 10 Claims



1. A loop storage bin for tape transport apparatus and through which a continuous loop of magnetic recording tape or the like may be continuously input and withdrawn, comprising:

means forming a generally rectangular body having front and rear walls disposed in parallel spaced apart relationship, said front and rear walls being spaced apart a distance slightly larger than the width of the tape to be stored therein;

means defining a tape entry opening at the top of said body for receiving incoming tape;

distributor means disposed proximate said opening and including a flexible arm, the distal end of which is caused to periodically engage a surface of said incoming tape so as to create waves therein;

means forming a compliant bottom surface for said bin and upon which said incoming tape is caused to stack; and

resilient shock absorbing means disposed within said bin on one side thereof and defining an exit passageway for said tape, said resilient means being engageable by said tape as it is withdrawn from the bottom of the stack and operative to damp lateral motion of said tape as it is withdrawn.

4,387,844

METHOD AND APPARATUS FOR RADIAL INERTIA WELDING OF DISSIMILAR METALS

Everett S. Frank, Waterloo, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 1, 1981, Ser. No. 269,139
Int. Cl.³ B23K *20/12*
U.S. Cl. 228—113 8 Claims

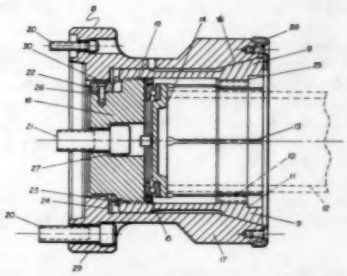
7. A headstock collet assembly for radial inertia welding of two cylindrical metallic elements, which comprises:

(a) a collet having an internally threaded rear end and a front end having jaws therein, a portion of the external surface of the jaws forming a truncated cone with the large diameter at the front end of the collet;

(b) a flange having a threaded portion threadably engaging the threaded rear end of the collet, a key attached to an external cylindrical surface of the flange rearwardly of the collet, a centered countersunk bolt hole, including a bolt to attach the flange to a headstock, a shoulder facing in the direction of the headstock;

(c) a thrust bearing located inside the collet, having the back race attached to a face of the flange and the front race facing the jaw end of the collet; and

(d) a collet housing ring inside of which is placed the threadably attached flange and collet, the end away from the collet jaws having an outward flange with bolt holes for attachment of the housing ring and therefore the entire collet assembly to the headstock, an inward flange at the same end forming a seat opposite the shoulder on the flange, a key way for engaging the key attached to the flange, a portion of the interior surface adjacent to the face of the collet jaws forming a truncated cone, complementing the truncated cone exterior surface of the collet jaws; whereby as the assembly is rotating, when attached to the headstock, a rotationally fixed axial force against the



front race of the thrust bearing will cause the collet jaws to move radially inward.

8. A method for radial inertia welding of two cylindrical metallic elements which comprises:

(a) assembling a collet inside a ring housing;

(b) rotatably attaching the collet and ring housing assembly to a headstock;

(c) placing a first cylindrical element inside the jaws of the collet;

(d) mounting a rotationally fixed second cylindrical element to a tailstock;

(e) rotating the collet and ring assembly to a predetermined speed and allowing it to free-wheel;

(f) rapidly advancing the second cylindrical element through the first element while the collet and ring housing assembly is free-wheeling at the predetermined rate of speed; and

(g) activating a means causing the collet jaws to move radially inwardly compressing the first cylindrical element onto the second cylindrical element, resulting in a radial inertia welding action.

4,387,845

METHOD AND APPARATUS FOR HOLDING AND COOLING A METAL TUBE DURING WELDING

Roy J. Mefferd, 219 W. Myrtle St., Laurens, Iowa 50554

Filed Oct. 30, 1980, Ser. No. 202,129
Int. Cl.³ B23K *31/06*
U.S. Cl. 228—222 7 Claims

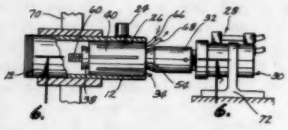
1. An apparatus for holding and cooling a metal tube having a cylindrical tube bore of predetermined diameter extending therethrough, said apparatus comprising:

a cylindrical mandrel having an external cylindrical surface of a diameter slightly less than said predetermined diame-

ter of said tube bore so as to permit slidable insertion of said mandrel into said tube bore;

said mandrel having a mandrel bore extending axially therethrough, said mandrel bore having a central portion of reduced diameter and having tapered portions at its opposite ends, said tapered portions commencing at said central portion and tapering radially outwardly towards the opposite ends of said mandrel;

said mandrel having a first set of elongated slots formed therein and extending axially inwardly from one of said opposite ends of said mandrel, a second set of elongated slots being formed in said mandrel and extending axially inwardly from the other of said opposite ends, each of said



slots having a length slightly less than the axial length of said mandrel,

cam means for creating a radial outward pressure against said tapered portions of said mandrel bore for spreading said slots and increasing the diameter of said mandrel, said cam means comprising first and second tapered wedges each engaging one of said tapered portions of said mandrel bore, and power means connected to said tapered wedges for forcing them towards said central portion of said mandrel bore; and

at least one coolant passageway extending internally through the walls of said mandrel, said passageway having an inlet opening and an outlet opening.

4,387,846

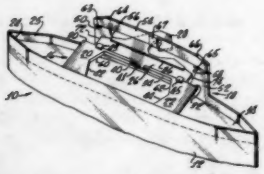
BAG HANDLE

Gerard M. DuCorday, 10871 Thorley Rd., Santa Ana, Calif. 92705

Filed Mar. 30, 1981, Ser. No. 249,160

Int. Cl.³ B65D *33/06*

U.S. Cl. 229—54 R **16 Claims**



1. A bag handle having mutually complimentary primary and secondary handle parts, each adapted to be connected to a bag section,

each said handle part comprising a pair of mutually spaced legs and a bail extending between and secured to said legs, the bail of said primary part having a length less than the distance between the legs of said secondary part at the bail of said secondary part, whereby the bail of said primary part can pass through said secondary part to position the outside surface of said primary part bail against the outside surface of said secondary part bail, said primary part legs extending beyond said primary part bail and having end portions mutually spaced by a distance greater than the distance between the legs of said secondary part, whereby said primary part legs cannot pass through said secondary part, and a hanger secured to one of said handle parts.

4,387,847

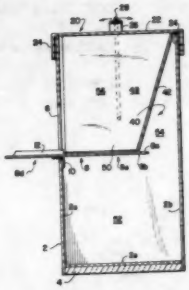
CONTAINER FOR STORING PARTICULATE MATERIALS

Donald O. Downey, 207 Sharp St., Strasburg, Va. 22657

Filed Jun. 19, 1980, Ser. No. 160,925

Int. Cl.³ B65D *91/00*

U.S. Cl. 232—43.1 **8 Claims**



1. A container for loading, storing and/or transporting particulate material such as ashes, coals or similar materials while preventing airborne contaminants such as smoke escaping therefrom, said container comprising:

(a) a container body comprising a front wall, a back wall, a pair of sidewalls, a bottom and an open top, said bottom wall being connected with the lower portions of said front, back and sidewalls to form the bottom of said container body, said container body being provided with an opening in said front wall having a generally horizontal lower edge;

(b) a removable cover member which closes said open top of said container body;

(c) deflection means attached to the lower surface of said cover member having a lower extremity which converges downward within said container body;

(d) a door member pivotally connected intermediate its ends along said lower edge of said front wall opening, to divide said door member into an outer portion larger than said front wall opening and an inner portion, said door member being pivoted from an open loading position wherein the outer portion of said door is substantially horizontal such that said particulate material can be disposed on said outer portion, said door member in said open loading position together with said deflection means dividing said container body into a loading chamber, a collection chamber and a deflection chamber, to a dumping position wherein said particulate material is dumped into said collection chamber, to a closed position wherein said outer portion of said door member closes said front wall opening.

4,387,848

CENTRIFUGE ASSEMBLY

Robert M. Kellogg, Endwell, and Alfred P. Mulzet, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

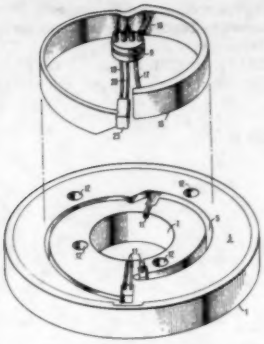
Filed Oct. 3, 1977, Ser. No. 839,156

Int. Cl.³ B04B *1/00*

U.S. Cl. 494—81 **13 Claims**

1. A centrifuge assembly comprising a rotor, means providing a two portion channel in said rotor, a first portion of said channel being circular-like and having a constant radius extending from the true center of said rotor, and a second portion of said channel being spiral-like and having a plurality of seg-

ments having different radiuses extending from centers displaced from said true center,



a disposable elongated container of semirigid material contained in and conforming to said channel, and
fluid connections to each end of said elongated container.

4,387,849

METHOD FOR DISPENSING AT A VISIBLY DETECTABLE RATE, CONTINUOUSLY OR DISCONTINUOUSLY, FOR DISCRETE PERIODS OF TIME AT A STEADY RATE, A VOLATILE COMPOSITION OF MATTER FROM A CONTAINER INTO THE ATMOSPHERE AS WELL AS THE CONTAINER USED IN THE METHOD

Augustinus G. Van Loveren, Rye; Marina A. Munteanu, New York, both of N.Y., and Geoffrey B. Seaber, Ijsselstein, Netherlands, assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 19, 1981, Ser. No. 245,542
Int. Cl.³ A61L *9/04, 9/01, 9/12*
U.S. Cl. 239—6 **20 Claims**

1. A hollow totally enclosed structure comprising a thin shell totally enclosing an inner void, said thin shell having a base portion and an upper portion, said base portion having an inner surface:

(i) at least a finite portion of said thin shell being transparent whereby that portion of said inner void which is located proximate to the base portion of said totally enclosed structure is visible from without said thin shell, in the presence of visible wavelengths of light;

(ii) contained totally within the said inner void of said thin shell and in place on said inner surface of said base portion, a volatile composition temporarily entrapped and totally entrapped at least at the instant in time of commencement of functional operation of said structure, in an entrapment material, said volatile composition being selected from the group consisting of perfume compositions, herbicide compositions, insecticide compositions, animal repellant compositions, air freshener compositions, pheremone compositions, odor maskant compositions, deodorant compositions and insect repellent compositions;

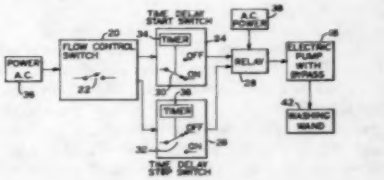
(iii) at least a finite section of said thin shell comprising a microporous polymer and termed "a microporous polymer shell section" having a porosity such that when said hollow totally enclosed structure is located in an inert gas at a pressure of less than or equal to about 1 atmosphere, said volatile material molecule are transported at a constant linear velocity and at a constant total derivative of concentration of volatile substance with respect to time onto the inner surface of said microporous polymer section via an adsorption mechanism and from the outer surface of said microporous polymer section to the surrounding atmosphere via a desorption mechanism.

4,387,850

REMOTE CONTROL APPARATUS FOR POWER WASHERS

Paul E. Gerber, Decatur, Ind., assignor to Modern Mill, Inc., Bluffton, Ind.

Filed Dec. 29, 1980, Ser. No. 220,379
Int. Cl.³ B05B *9/04*
U.S. Cl. 239—124 **9 Claims**



1. Remote control apparatus for power washers comprising a water line having a flow control switch device in series therewith, said water line having input and output ends, the input end being adapted to be connected to a source of water, the output end being adapted to be connected to the input side of a motor operated water pump, said flow control switch device including an electrical flow responsive switch which is actuated in response to water flow through said line and is deactuated in response to the absence of such flow, a time-delay starting switch device connected to said flow responsive switch and including a starting timer switch which is actuated after a predetermined period of time in response to actuation of said flow responsive switch and is deactuated directly in response to deactuation of said flow responsive switch, said starting switch device further including a timer for operating said starting timer switch which is actuated in response to actuation of said flow responsive switch and is reset upon deactuation of said flow responsive switch, control means responsive to actuation and deactuation of said starting timer switch for controlling correspondingly an energizing circuit for an electric pump motor, a time-delay stopping switch device connected to said flow responsive switch and including a stopping timer switch which is actuated after a predetermined period of time in response to deactuation of said flow responsive switch and is deactuated directly in response to actuation of said flow responsive switch, said stopping switch further including a timer for operating said stopping timer switch which is activated in response to deactuation of said flow responsive switch and is reset upon actuation of said flow responsive switch, said control means being responsive to actuation and deactuation of said stopping timer switch for controlling correspondingly said pump motor energizing circuit.

4,387,851

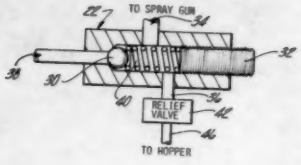
APPARATUS FOR HEATING AND SPRAYING VISCOUS COATING MATERIAL

Edward R. Dick, 13609 Larner Rd., Chesaning, Mich. 48616

Filed May 18, 1981, Ser. No. 264,278
Int. Cl.³ B05B *1/24*
U.S. Cl. 239—135 **3 Claims**

1. A self-contained mobile apparatus for distributing a viscous coating material onto a surface to be coated, comprising:

a supply reservoir for holding said material, heating means for heating said material and decreasing its viscosity, a gear pump having an intake communicating with said supply reservoir and an outlet communicating with said heating means, said heating means including a high pressure relief valve having a moveable ball valve and spring action on said ball valve to urge said ball valve toward a closed position, screw means acting on said spring for adjusting the tension and the load exerted by said spring to a predetermined value, said valve



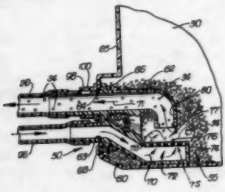
means being moveable from a closed position in response to fluid pressure at said pump outlet exerting a force in excess of the opposing force exerted on said ball by said spring whereby the heat of friction due to the flow of the viscous material through the open valve reduces the viscosity of said material, said heating means including an outlet downstream of said valve means communicating with a flexible conduit connected to a selectively operable spray gun to dispense material to the surface to be coated.

4,387,852

FERTILIZER SPREADER

Charles A. Mattson, Woodland Hills; James Michel, Agoura, and Anthony Domagalski, Moorpark, all of Calif., assignors to Allegretti & Co., Chatsworth, Calif.

Filed Sep. 11, 1981, Ser. No. 301,404
Int. Cl.³ B05B *11/06*
U.S. Cl. 239—143 **39 Claims**



1. Apparatus for entraining particulate material within a discharge air stream of an air blower, comprising:

an adapter nozzle having a Venturi throat formed therein for passage of the discharge air stream;

a container for receiving a supply of the particulate material;

first means including a pressure tube extending into said container for coupling a portion of the discharge air stream to the interior of said container and a diffuser for separating said air stream portion into a plurality of relatively turbulent air flows for agitating and fluidizing a localized region of the particulate material within said container; and

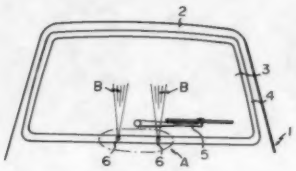
second means including a suction tube extending into said container and terminating with an open end disposed generally adjacent said localized region for coupling said localized region to said Venturi throat for drawing of the fluidized particulate material from said container into said adapter nozzle for entrainment with the discharge air stream.

4,387,853

WASHING LIQUID INJECTION DEVICE FOR THE REAR WINDOW GLASS OF A VEHICLE

Hiroshi Sarai, Toyota, and Gosaku Terabayashi, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 8, 1981, Ser. No. 281,375
Claims priority, application Japan, Jul. 25, 1980, 55-104437[U]
Int. Cl.³ B05B *1/10*
U.S. Cl. 239—284 R **7 Claims**



1. A device for injecting a washing liquid onto a rear window glass which is fixed onto a vehicle body and has a lower peripheral edge covered by a window molding, said device comprising:

a nozzle apparatus fixed onto said window molding which covers the lower peripheral edge of the rear window glass and having a washing liquid inlet and a washing liquid outlet which is directed to a predetermined area on the rear window glass; and

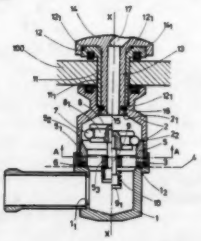
a washing liquid conduit apparatus arranged under the window molding and having a washing liquid inlet and a washing liquid outlet which is fluidly connected to the washing liquid inlet of said nozzle apparatus, said washing liquid conduit apparatus comprises a molding retainer having a washing liquid feed bore therein, and a washing liquid conduit supported by said molding retainer and connected to said washing liquid feed bore, said molding retainer comprises a bolt integrally formed thereon and passing through an opening formed on the vehicle body and is fixed onto the vehicle body by means of a nut screwed onto said bolt, said washing liquid feed bore being formed in said bolt.

4,387,854

NON-RETURN VALVE WITH A DIRECTIONAL INJECTOR

Robert Dupont, 7, rue Mirabeau, Paris, France

Filed Nov. 10, 1980, Ser. No. 205,507
Claims priority, application France, May 19, 1980, 80 11132; May 20, 1980, 80 11277
Int. Cl.³ B05B *1/22*
U.S. Cl. 239—570 **10 Claims**



1. A fluid injector apparatus for a bath enclosure, comprising:

a check valve which includes a body having an outlet, a truncated cone-shaped valve seat and a ring member with a bottom portion which defines apertures for the passage of fluid and an axial aperture, said valve further including a disc defining a peripheral groove and having a seal seated therein for sealing engagement with the valve seat, and a rod slidably received in the axial aperture for carrying the disc; and

a swiveling injector which includes a sleeve having an end flange at one end, said sleeve being threadably received in the valve body outlet, said injector further including a tube rotatably carried within the sleeve and having a head member adapted to substantially cover and bear against the sleeve end flange, said head member defining an oblique aperture, and said tube defining a conduit fluidically coupling the valve outlet to the head member aperture, and an external seal groove around the periphery of the tube, and said injector further including a seal received in the tube seal groove and bearing against the sleeve.

4,387,855

SALT AND/OR GRAVEL SPREADER

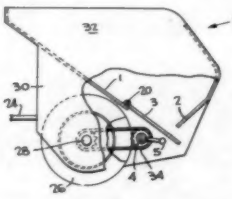
Niels J. O. Nielsen, Karolinegade 6, DK-6000 Kolding, Denmark

Continuation-in-part of Ser. No. 943,776, Sep. 20, 1978, abandoned. This application Feb. 10, 1981, Ser. No. 233,088

Claims priority, application Denmark, Oct. 11, 1977, 4498/77; Feb. 13, 1978, 648/78

Int. Cl.³ A01C *3/06*

U.S. Cl. 239—659 **12 Claims**



1. Salt and/or gravel spreader comprising a container having side walls and two oppositely situated bottom walls transverse to the direction of travel inclined downwards towards an oblong slot defined between the lower ends of said walls, and a mechanism for discharging salt and/or gravel through said slot comprising at least one slat pivotably mounted on the lower part of one of said inclined bottom walls as an extension thereof protruding below the other inclined bottom wall, a rotatable shaft rotatably mounted on said container below said slat, a cam for each slat mounted on said shaft to revolve therewith to engage said slat during part of its revolution to move said slat in an oscillating motion into and away from engagement with the lower edge of said other inclined bottom wall to respectively close and open said slot, and means to rotate said shaft.

4,387,856

METHOD FOR OPERATING AN INSTALLATION FOR PROCESSING WASTE PAPER

Harald Selder, Schlier, Fed. Rep. of Germany, assignor to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,086

Claims priority, application Switzerland, Oct. 10, 1979, 9135/79

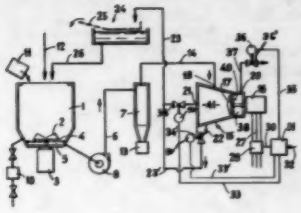
Int. Cl.³ B02C *23/38*

U.S. Cl. 241—28 **4 Claims**

1. A method of operating an installation for the processing of waste paper comprising the steps of:

providing a stock pulper and a device arranged after the stock pulper, with respect to the direction of flow of the stock suspension, this device having a housing in which there is arranged a closed defiberizing chamber, a rotor driven by a drive motor and a sieve at which merges a good stock chamber from which there outwardly leads a good stock line, as well as at least one reject line leading towards the outside from the defiberizing chamber for contaminants which are to be separated;

measuring the rotational moment of the rotor; and



controlling the separation of the suspension through the reject line as a function of the rotational moment of the rotor such that upon increase of the rotational moment of the rotor there is intensified the separation of the suspension through the reject line and upon decrease of the rotational moment of the rotor there is reduced the separation of the suspension through the reject line.

4,387,857

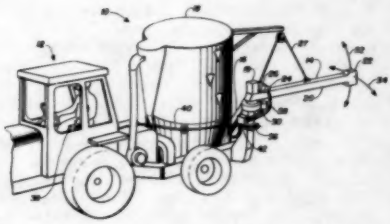
GRINDER-MIXER CONTROLS

Terry A. Young, Lititz; William W. Mann, Leola; Charles M. Kline, Reinholds, and Ernest A. Schoeneberger, New Holland, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Jan. 14, 1981, Ser. No. 225,068

Int. Cl.³ B02C *25/00*

U.S. Cl. 241—101 B **4 Claims**



1. In combination with a power source, a grinder-mixer including a mixing tank and an auger for unloading said mixing tank, the improvement comprising:

(a) a first hydraulic motor for moving said auger in a generally vertical path;

(b) a second hydraulic motor for moving said auger in a generally horizontal path;

(c) a first pair of electric solenoid valves for operating said first hydraulic motor in order to move said auger in said generally vertical path;

(d) a second pair of electric solenoid valves for operating said second hydraulic motor in order to move said auger in said generally horizontal path;

(e) a first and a second electrical switch for controlling said first pair of electric solenoid valves;

(f) a third and a fourth electrical switch for controlling said second pair of electric solenoid valves;

(g) said first and third electrical switches being located on said grinder-mixer; and

(h) said second and fourth electrical switches being located remote from said grinder-mixer on said power source.

4,387,858

MACHINE FOR THE COMMINUTING OF BULK MATERIAL

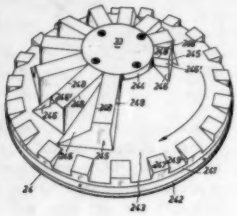
Kurt Rössler, Belm, Fed. Rep. of Germany, assignor to Osnabrücker Metallwerke J. Kampschulte GmbH & Co. KG, Osnabrück, Fed. Rep. of Germany

Filed Jul. 9, 1980, Ser. No. 167,287

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928471

Int. Cl.³ B02C *18/12*

U.S. Cl. 241—152 A 2 Claims



1. In a comminution apparatus, the combination comprising a housing for receiving material to be comminuted, a stator mounted in said housing, said stator having stator cutting edge means, a rotor rotatably mounted in said housing, said rotor having rotor cutting edge means, said stator cutting edge means and said rotor cutting edge means each having a plurality of cutting edges which cooperate during rotation of said rotor to effect comminution of said material, at least one of said cutting edge means having the cutting edges thereof constructed with progressively longer cutting edges considered in the direction of rotation of said rotor such that the material being comminuted is progressively engaged by said progressively longer cutting edges, said stator cutting edge means and said rotor cutting edge means each comprising a plurality of second cutting edges disposed generally radially outwardly of the first said respective cutting edges thereby providing for two-step comminution, said second rotor cutting edges being at an outer peripheral portion of said rotor, said second stator cutting edges cooperating with said second rotor cutting edges to define the second step for said two-step comminution, the first said rotor cutting edges being disposed in a first plane perpendicular to the axis of rotation of said rotor, said second rotor cutting edges being disposed in a second plane perpendicular to the axis of rotation of said rotor, said first plane being spaced from said second plane.

4,387,859

RESONANTLY-POWERED CRUSHER

Raymond A. Gurries, Reno, Nev., assignor to Resonant Technology Co., Sparks, Nev.

Filed May 15, 1981, Ser. No. 263,848

Int. Cl.³ B02C *1/04, 19/18*

U.S. Cl. 241—262 9 Claims

1. An apparatus for crushing large masses, the apparatus comprising:

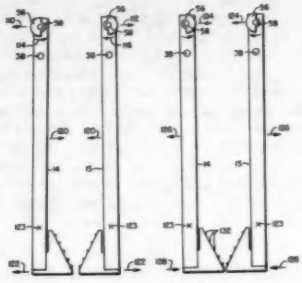
a supporting frame;

a pair of resonant beams with similar resonant characteristics having anti-nodes at each end and nodes spaced inward from the ends,

said beams being suspended from the frame at a location on each beam substantially coincident with the node proximate the upper end of the beam;

means for inducing a standing lateral wave in each of the beams at or near the resonant frequency of the beams so that the lower ends of the beams move toward and away from each other in a synchronous manner;

means mounted on the lower ends of the beams for striking the masses as they are fed to the apparatus and for imparting opposed compressive forces to the masses which result in the masses being crushed;



means for engaging the beams at the nodes proximate their lower ends to bias said beams toward one another at said lower nodes to counteract the reaction forces of the beams striking the masses.

4,387,860

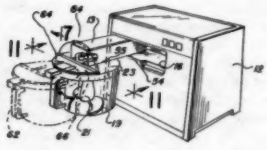
FOOD PROCESSOR

Donald E. Necas, Lincoln Township, Berrien County, and Aman U. Khan, Stevensville, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 3, 1980, Ser. No. 203,712

Int. Cl.³ B02C *18/10, 18/18*

U.S. Cl. 241—282.1 5 Claims



1. A multipurpose culinary food processor comprising:

a housing defining an outwardly opening recess;

a drive mechanism;

an enclosure having a bottom and a side wall;

means on the drive mechanism for removably suspending the enclosure from the drive mechanism;

food processing means including food cutting blades;

means for supporting the food processing means on the bottom of the enclosure;

connecting means for removably driving the processing means from the drive mechanism; and

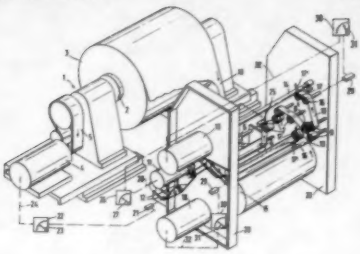
means for selectively positioning the drive mechanism and said enclosure suspending means in a retracted inoperative disposition within said recess separately of said processing means with said enclosure and food processing means removed therefrom, and in an operative disposition extending from said housing with said enclosure and food processing means removably installed thereon.

4,387,861

MACHINE FOR SEPARATING DOUBLE-ROLLED ALUMINUM SHEET

Eberhard Kampf, Wiehl, Fed. Rep. of Germany, assignor to Erwin Kampf GmbH & Co., Wiehl, Fed. Rep. of Germany

Filed Aug. 5, 1981, Ser. No. 290,669
Int. Cl.³ B65H *23/20, 35/02*
U.S. Cl. 242—75.47 **3 Claims**



1. A machine for separating double-rolled thin aluminum sheet into two separate sheets and for winding the sheets onto two winding shafts, the machine comprising in combination:

a supply shaft adapted to carry a supply coil of double-sheet;

a supply shaft drive, including a motor-generator operating as a motor for the acceleration of the supply coil from standstill to operating speed and as a regenerative braking generator for the application of a braking torque to the supply shaft following acceleration;

a sheet processing section arranged in parallel alignment with the supply shaft to receive the double-sheet from the supply coil, said section including a sheet separating roll, a plurality of sheet deflecting rolls and a winding shaft for each of the two separate sheets with a variable-speed winding motor connected thereto;

circuit means for controlling the torque output of the motor-generator in such a way that the speed at which the double-sheet is unwound from the supply coil is maintained substantially constant, following acceleration of the supply coil; and

circuit means for controlling the torque output of the two winding motors in such a way that the tension at which the separate sheets are wound onto their winding shafts is maintained substantially constant, independently of the sheet speed.

4,387,862

SEAT BELT RETRACTOR

Kenichi Sakuraba, Yokohama; Hiroyuki Yoshida, Tokyo, and Tadahiko Ozaki, Kosai, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 6, 1981, Ser. No. 241,131
Claims priority, application Japan, Mar. 8, 1980, 55/29354
Int. Cl.³ A62B *35/00;* **B65H** *75/48*
U.S. Cl. 242—107.6 **1 Claim**

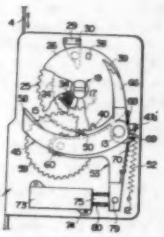
1. A seat belt retractor for a safety belt arrangement having a seat belt attached with a buckle and a tongue engageable with each other for reliably restraining and safely protecting a seat occupant against serious injury in the case of emergency as in a collision or sudden stop of passenger vehicle, comprising;

belt retracting means comprising a retractor housing, a winding reel received in said retractor housing so as to be rotatable in directions to wind and unwind said seat belt, a return spring for biasingly urging said winding reel to rotate in the direction to wind said seat belt, a cap member securely mounted on said retractor housing, and stationary shaft member extending between said winding reel and said cap member and fixedly supported on said cap member;

signal emitting means comprising an electric switch mounted in said buckle so as to be closed and opened for respectively emitting said operative and inoperative signals when said tongue is engaged with and disengaged from said buckle;

clutching means comprising a drive gear fixed to said winding reel so as to be rotatable together therewith, a driven gear rotatably supported on said shaft member, a trigger member pivotally mounted on said retractor housing and having a pivotal axis, a pair of idler gears rotatably supported on said trigger member and engageable with said drive and driven gears, respectively, and an electromagnetic actuator connected to said trigger member and actuated in response to said operative and inoperative signals from said electric switch for making said idler gears engaged with and disengaged from said drive and driven gears, respectively, through rotation of said trigger member around said pivotal axis thereof;

belt slackening means comprising a disc member rotatably supported on said shaft member and formed on its circumference with a cut-away recess, a first stop projection fixed to said disc member, a biasing member for biasing said disc member into frictional contact with said driven gear, a second stop projection fixed to said cap member to be engageable with said first stop projection when said disc member is rotated in the direction to wind said seat belt, a spear headed stop projection fixed to said disc



member between said first stop projection and said cut-away recess, a stopper arm pivotally mounted on said retractor housing to be engageable with said spear headed stop projection, and a biasing member for biasing said stopper arm into engageable with said spear headed stop projection;

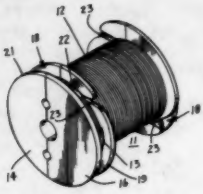
tension eliminating means comprising a ratchet wheel securely mounted on said winding reel, a swing arm pivotally mounted on said retractor housing and having a pawl engageable with said ratchet wheel and a protrusion engageable with said cut-away recess of said disc member, and a swing arm biasing member for biasing said swing arm to bring said pawl into engagement with said ratchet wheel; and

tensionless belt position memorizing means comprising an additional ratchet wheel rotatable supported on said shaft member between said drive and driven gears, a stopper fixed to said retractor housing for preventing said additional ratchet wheel from being rotated in the direction to wind said seat belt, a pawl member secured to said driven gear for preventing said additional ratchet wheel from being rotated in the direction to wind said seat belt, and a spiral spring having an inner end fastened to said shaft member and an outer end fastened to said additional ratchet wheel for biasingly forcing said additional ratchet wheel to be rotated in the direction to wind said seat belt.

4,387,863
SPOOL ASSEMBLY

Donald R. Edmonston, Atlanta, and Frederick R. Weaver, Snellville, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 17, 1981, Ser. No. 331,715
Int. Cl.³ B65H 75/12, 75/28
U.S. Cl. 242—118.4 8 Claims



1. A spool adapted to hold one or more windings of an elongated material having at least one end terminated with a connector, said spool comprising:

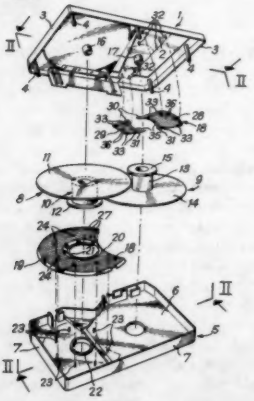
a circular hub having a first circular flange at one end thereof and a second circular flange at the other end thereof, each of said flanges comprising first and second peripheral rims, one of said rims being of greater diameter than the other rim, means forming a channel between said rims comprising a region of lesser diameter than said rims; and

the rim closer to the hub in each of said flanges having a flared groove therein extending from said channel to a point tangent to the hub, the groove in the rim of said first flange extending in a direction opposite to the groove in the rim of said second flange.

4,387,864
VIDEO CASSETTE

Patrick P. Posso, Lausanne, Switzerland, assignor to Gefitec S.A., Lausanne, Switzerland

Filed Mar. 16, 1981, Ser. No. 244,271
Claims priority, application France, Mar. 26, 1980, 80 06756
Int. Cl.³ G03B 1/04; G11B 15/32
U.S. Cl. 242—199 4 Claims

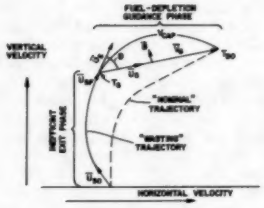


1. A video cassette structure comprising a casing; two spools, each spool having a hub and a single disk thereon, said hubs being rotatably mounted on said casing and positioned to enable substantially the minimum possible distance between the axes of rotation of said spools, said disks being respectively contiguous to a first and second base of said casing; first and second molded parts of polyacetal resin respectively fixed to said first and second bases opposite the non-contiguous disk by non-deformable securing means, each said molded part projecting from its base toward the non-contiguous disk and forming a fixed guiding surface extending in the same plane as the internal face of the contiguous disk on said base.

4,387,865
METHOD FOR STEERING A SOLID PROPELLANT BALLISTIC VEHICLE

Peter B. Howard, Arlington; Martin V. Boelitz, Watertown, and Thomas W. De Swarte, North Reading, all of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1980, Ser. No. 181,023
Int. Cl.³ F42B 13/28
U.S. Cl. 244—3.1 5 Claims



1. A method for steering a solid propellant ballistic vehicle during powered flight which eliminates the requirement for cutoff control in booster stages, said method comprising the step of steering said vehicle along a fuel-inefficient trajectory such that at engine burnout (T_{BO}) said vehicle has obtained a velocity vector which will enable said vehicle to reach the desired target at a desired time, said fuel-inefficient trajectory including:

(a) an exit phase which is a function of vehicle launch parameters;

(b) a fuel-depletion guidance (FDG) phase taking place in a plane perpendicular to a predetermined read-vector ($\overline{D}$), said FDS phase comprising an arc circle whose chord is $\overline{V}_G$ at transition from said exit phase to said FDG phase, said arc being defined by the equation

$$\frac{\sin\theta}{\theta} = \frac{|\overline{V}_G|}{V_{CAP}}$$

where θ is the angle between the vehicle thrust vector ($\overline{U}_S$) and $\overline{V}_G$, V_{CAP} is the remaining vehicle velocity capability and, $\overline{V}_G$ is the remaining velocity-to-be-gained vector, and;

(c) a guidance freeze phase just prior to said T_{BO} to prevent guidance instabilities at said T_{BO}.

4,387,866

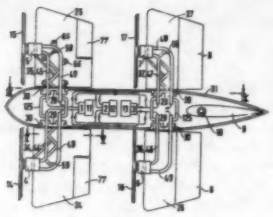
FLUID MOTOR DRIVEN PROPELLER-AIRCRAFT FOR VERTICAL TAKE OFF AND LANDING WITH A MULTIPURPOSE PIPE STRUCTURE

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan (240-01)

Division of Ser. No. 973,780, Dec. 27, 1978, which is a continuation-in-part of Ser. No. 760,006, Jan. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 487,272, Jul. 10, 1974, Pat. No. 4,009,849, said Ser. No. 487,272, is a continuation-in-part of Ser. No. 104,672, Mar. 8, 1971, Pat. No. 3,825,898. This application Jan. 30, 1981, Ser. No. 229,910

Int. Cl.³ B64C *29/00*

U.S. Cl. 244—7 C **1 Claim**



1. In an aircraft in combination;

a body, at least one power plant, at least four propellers, at least two pairs of wing-portions, hydrostatic fluid transmission means including a pump arrangement and fluid motors between said power plant and said propellers to drive said propellers by rotors of said motors with one propeller each fastened to at least one rotor of one of said motors, means to varify the angles of said wing-portions and propellers relatively to the ground, synchronization means in said hydrostatic transmission means to synchronize the rotary velocities of said propellers and a novel structure in a plurality of such novel structures;

wherein said novel structure includes at least three pipes;

wherein one of said three pipes is located laterally of the other two of said at least three pipes;

wherein said structure includes ribs between said at least three pipes to prevent deformation and dislocation of said pipes relatively to each other;

wherein said pipes and said ribs are forming a rigid structure of a capability to carry a multi-directional load of at least two components of directions of load whereof one of said components is substantially normal to the other of said components of directions of load;

wherein said pipes with the exception of a probable slight inclination relatively to each other are substantially parallel to each other and are of diameters of a fraction of the distances of their axes from each other;

wherein the outer ends of at least two of said at least three pipes are connected to ports of one of said motors;

wherein said structure carries and holds on said outer ends of said pipes at least one motor of said motors;

wherein at least two of said pipes are utilized as hydrostatic fluid delivery - and fluid return - lines to lead fluid from said pump arrangement to said motor and from said motor at least insdirectly back to said pump arrangement;

wherein holding means are provided on said structure;

wherein said holding means are utilized to hold and carry at least one portion of said wing-portions;

wherein said structure includes a pivotable bearing means;

wherein said bearing means is pivotably borne in a bearing housing which is provided on said body;

wherein said pump arrangement delivers plural separate fluid pressure flows of proportionate rates of flow equal in number to the number of said motors and equal to the number of said propellers;

wherein each of said delivery fluid lines passes one of said separate flows of proportionate rate of flow to one of said motors to assure by said proportionate rates of flows proportionate angular rotary velocities of the rotors of said motors and thereby of said propellers;

wherein the inner ends of at least two of said at least three pipes are movably connected to ports of a pump means of said pump arrangement in said transmission to lead fluid from said pump arrangement to said pipes and vice - versa;

whereby said structure provides in combination;

a; the holding of said motor;

b; the holding of said wing-portion;

c; the temporary varification of the relative angle of said propeller and of said wing-portion relatively to the ground and to said body;

d; the transfer of motor-driving pressure fluid of a rate of flow proportionate to the respective rate of flow of fluid in an other structure of said plurality of structures to and from said motor to drive said propeller with a rotary angular velocity proportionately relatively to the rotary angular velocity of an other of said propellers and whereby said structure also provides

e; the carrying of said body by said wing - portion and said propeller during operation of said aircraft in the air;

wherein two of said structures are combined together on their inner portions to form a common structure with oppositionally directed outer portions,

wherein connecters which include at least three medial connection pipes are provided on the inner portions of said structures to connect said structures rigidly;

wherein each of said inner portions of said structures is provided with one of said bearing means and

wherein said bearing means are pivotably borne in a pair of bearing housings of aid body; and;

wherein said medial pipes of said connecters are fastened to said pipes of said two of said structures in a small distance from the said inner ends of said pipes of said structures and said medial connection pipes of said connecters include laterally bent portions on the ends of said medial connecter pipes to permit open inner ends of said pipes of said structures for cleaning of the interiors of said pipes and for smooth connection of said pipes to at least partially movable fluid lines between said inner ends of said pipes of said structures and said pump means of said pump arrangement, while said medial connection pipes form between said bended portions on their ends medial connecter portions of substantially parallel axes and one of said medial connecter portions laterally to others of said medial connector portions.

4,387,867

FLYING CRAFT

Heinz Jordan, Carinthia, Austria, assignor to Technische Gerate-u Entwicklungsgesellschaft m.b.H., Wolfnitz/Klagenfurt, Austria

Continuation-in-part of Ser. No. 956,005, Oct. 30, 1978, Pat. No. 4,273,302. This application May 27, 1981, Ser. No. 267,493

Claims priority, application Austria, Oct. 31, 1977, 7749/77; Jun. 13, 1978, 4309/78; Jun. 13, 1978, 4310/78; Feb. 1, 1980, 537/80

Int. Cl.³ B64C *29/00, 39/06*

U.S. Cl. 244—12.2 **5 Claims**

1. A flying craft, comprising, an outer supporting means which has an annular airflow opening extending vertically therethrough, at least one driving means supported on the

supporting means for propelling a stream of air downwardly through the opening, a carrier supported by the supporting means, an upper set and a lower set of air deflecting vanes, each set of vanes having at least two adjustable pitch vanes, said sets of vanes being spaced apart and located in the stream of air produced by the driving means, and a supporting member, said driving means being mounted on the supporting member, said upper set of vanes being fixed only to the driving means, said lower set of vanes each having one end attached to the supporting means and one end attached to the supporting member, said supporting member being rotatably mounted relative to the driving means.

4,387,868

METHOD AND APPARATUS FOR LAUNCHING AND INFLATING A SPACE BALLOON

Robert Regipa, Toulouse, France, assignor to Centre National d'Etudes Spatiale, Paris, France

Filed Dec. 22, 1980, Ser. No. 218,728
Claims priority, application France, Jan. 4, 1980, 80 00344
Int. Cl.³ B64B *1/40*
U.S. Cl. 244—31 **12 Claims**

12. A carrier balloon for launching and inflating a load-carrying space balloon, said carrier balloon having a generally elongated cylindrical shape and having upper and lower poles, tie means connecting said poles and passing through said carrier balloon, a plurality of longitudinally extending gores, said gores being of substantially constant width over a major portion of the length thereof, longitudinally extending reinforcing tapes connecting the edges of adjacent gores so as to form said carrier balloon, said reinforcing tapes extending below the lowermost edge of said gores and being attached to said tie means so as to form an opening at the lower pole of said carrier balloon, and the upper pole of said carrier balloon being closed.

4,387,869

MONO-ELEMENT COMBINED SUPERCRITICAL HIGH LIFT AIRFOIL

Robert J. Englar, Derwood, and Gregory G. Huson, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1981, Ser. No. 238,265
Int. Cl.³ B64C *21/04*
U.S. Cl. 244—207 **3 Claims**

1. A mono-element airfoil for providing high lift generation, drag reduction and high cruise performance at subsonic and transonic speeds, comprising:

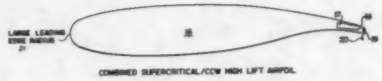
a supercritical airfoil means having a large leading edge radius and a relatively blunt trailing edge, said trailing edge having a thickness of about 2% of the chord length of said airfoil means;

a plenum inside said wing having an inlet connected to a source of gas pressure and an outlet in the trailing edge of said airfoil means;

said outlet being formed as a slot means between an upper portion and a lower portion;

said upper portion being a part of the upper surface of said wing and having a reduced thickness near the rear edge;

said lower portion forming the rear wall of said plenum, the lower edge of said slot and the trailing edge of said airfoil



means, said lower portion being circular in cross section and having a constant radius of no greater than 1% of the chord length of said supercritical airfoil means;

said slot means having a smoothly converging nozzle with the portion of said nozzle having the minimum height being at the rear edge of said upper portion;

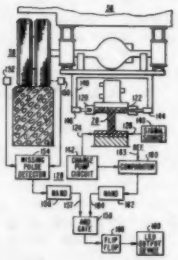
said outlet forming a circulation control device wherein gas from said source of gas pressure is controlled to travel through said plenum, escape through said converging nozzle and slot means and travel along the trailing edge of said airfoil to deflect the air traveling over the top surface of said airfoil means downwardly.

4,387,870

TRANSIT VEHICLE SHUNT DETERMINATION

Thomas C. Matty, North Huntingdon; James H. Franz, Jr., Murrysville, and Carol D. Parham, Jefferson Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1981, Ser. No. 258,508
Int. Cl.³ B61L *1/20, 23/00*
U.S. Cl. 246—122 R **5 Claims**



1. In shunt determination apparatus operative with a vehicle including a conductive shunt circuit, said vehicle being operative with a roadway track including first and second conductive rail members, the combination of,

a first electrically isolated rail provided as a section of said first rail member,

a second electrically isolated rail provided as a section of said second rail member,

means providing a first output signal in response to the presence of said vehicle at a predetermined location in relation to the first and second isolated rails along the length of said roadway track,

means supplying a control signal to the first isolated rail,

means coupled with the second isolated rail and providing a second output signal in relation to said control signal being conductive through said shunt circuit to establish

that said shunt circuit is conductive between said first and second isolated rails, and

indication means energized in response to the first output signal and the second output signal being provided to indicate the operation of said shunt circuit.

4,387,871

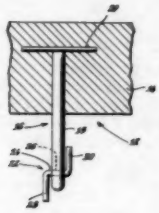
INSULATING MODULE INCLUDING A HEATER ELEMENT SUPPORT

Peter J. Loniello, Watertown, Wis., assignor to General Signal Corporation, Stamford, Conn.

Division of Ser. No. 931,757, Aug. 7, 1978. This application May 21, 1981, Ser. No. 265,775

Int. Cl.³ E21F *17/02*

U.S. Cl. 248—58 **5 Claims**



1. A method of supporting a rod overbend heating element from an insulated roof, comprising the steps of:

forming an insulating body with a plurality of support rods extending outwardly therefrom and with each of said support rods having an element-supporting keeper associated therewith which is rotatable between first and second positions about an axis transverse to said support rod, each of said keepers being formed with fingers extending in opposite directions from said transverse axis with said fingers lying in a vertical plane when said keeper is in its first position and lying in a horizontal plane when said keeper is in its second position;

placing said keeper in its first vertical position;

moving said heating element towards said body with sections of the element straddling said support rods until the heating element has reached a position between the keepers and the body;

placing the keepers in their second positions; and

resting the heating element on the fingers of the keepers.

4,387,872

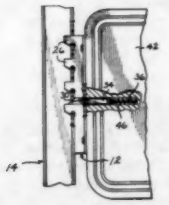
LATCH FOR A TAB AND SLOT MOUNTING BRACKET

Norman E. Hogue, Niles, Mich., assignor to Packard Industries, Inc., Niles, Mich.

Filed Jan. 17, 1981, Ser. No. 274,435

Int. Cl.³ A47B *57/00*

U.S. Cl. 248—221.3 **5 Claims**



1. In combination a mounting bracket and latch, said mounting bracket including a base plate and receiver having a slot therein, said base plate including a hooked tab means extending therefrom, said tab means for insertion into said receiver slot and interlocking with the receiver upon vertical movement relative to the receiver with a space being provided between the top of said tab means and the upper end of the receiver slot, said base plate carrying a positionable object, the improvement wherein said object includes a bore formed in general alignment with the top of said tab means, said latch including a plunger slidably positioned within said object bore, said plunger including a front end portion and a rear end portion, a spring contacting said plunger rear end portion and normally urging said plunger into an extended position with said plunger front end portion located over said tab means, said plunger front end portion contacting said receiver above said receiver slot and shifting said plunger into a retracted position when said tab means is inserted into said receiver slot, said spring urging said plunger into its said extended position with said plunger front end portion projecting into said receiver slot between said slot upper end and said tab means top upon said vertical movement of the tab means relative to the receiver whereby disengagement of the tab means from the receiver is prevented, rotatable cam means carried by said object and contacting said plunger at its rear end portion for urging said plunger into its retracted position upon rotation of the cam means to allow for withdrawal of the tab means from said receiver slot.

4,387,873

DEVICE FOR SUSPENSION OF A SOLUTION CONTAINER

John A. Pavlo, Hanover Park, and Ronald C. Stauber, Hawthorne Woods, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 16, 1981, Ser. No. 244,188

Int. Cl.³ E04G *5/06*; F16L *3/08*

U.S. Cl. 248—226.4 **5 Claims**

1. A device for suspension of a solution container which comprises:

(a) an elongated, flexible, foldable strap;

(b) said strap attached at one end to a C-clamp type bracket, said bracket adapted to be secured to an elevated surface;

(c) adjusting means integral with said bracket to enable attachment and detachment of said bracket to said elevated surface; and

(d) hook means for suspension of said solution container, said support means adjustably engagable with said strap at any desired location on said strap said hook further comprising: a Velcro type material strip integral with said hook, said Velcro type material strip attachable and detachable from

said strap, said strap made of a Velcro type material suitable to mate with said Velcro type material strip.

4,387,874

ADJUSTABLE VEHICLE SEATS AND THEIR ADJUSTMENT MECHANISMS

Bernard Boisset, Etampes, France, assignor to Societe Industrielle Bertrand Faure, Etampes, France

Filed Nov. 6, 1980, Ser. No. 204,698
Claims priority, application France, Nov. 14, 1979, 79 28119
Int. Cl.³ A47D *19/04*; B60N *1/06*
U.S. Cl. 248—396 10 Claims

1. An adjustable vehicle seat, comprising:

a base including means for mounting the base to a vehicle;

a sitting portion and a seat back carried on said base by a mechanism including means for reversably adjusting at least part of at least one of the sitting portion and seat back relative to at least another of the seat back, the sitting portion and the base to provide at least a first adjustment, of which each adjustment has two opposite extremes;

said sitting portion having a front end and two opposite sides extending to said front end;

said mechanism means including a system of mechanical linkages including a first bar located with its own longitudinal axis disposed horizontally, transversally of the vehicle seat near said front end of said sitting portion and so as to have an end thereof accessible at one of said sides of said sitting portion;

a rotatable control member mounted on said end of said bar, beside said sitting portion adjacent the front end of said sitting portion and rotatably incorporated in said system of mechanical linkages;

said system of mechanical linkages being constructed and arranged so that rotation of said control member about said transverse axis in one angular sense produces said first adjustment toward one extreme thereof; and rotation of said bar about said transverse axis in an opposite angular sense produces said first adjustment to the opposite extreme thereof.

4,387,875

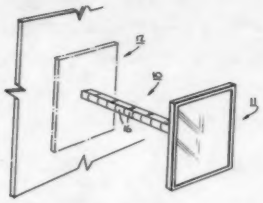
ADJUSTABLE SUPPORT

Hiroshi D. Ohori, 20 Bay View Dr., Toms River, N.J. 08753

Filed Dec. 23, 1980, Ser. No. 219,229
Int. Cl.³ A47G *1/24*
U.S. Cl. 248—480 14 Claims

1. An adjustable support comprising

a pair of elongated flexible members for disposition in an interlocked relation to define a relatively rigid structure; each said flexible member including a flat strip having a plurality of apertures and two parallel rows of spaced apart blocks disposed along one surface of said strip to define a channel-shaped cross section with said strip; each said block of one member being sized to fit into a space between a pair of adjacent blocks of the other member and having a projecting tab in a respective aperture and wherein each block of one member has an inwardly curved forward face with a groove therein and an outwardly curved rear face with a groove therein and each block of the other member has an inwardly curved forward face with a projection thereon for reception in a groove of an outwardly curved rear face of one block of said one member and an outwardly curved rear face with a projection thereon for reception in a groove of an inwardly curved forward face of another block of said one member.

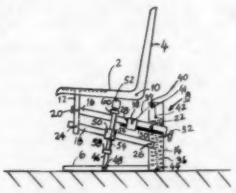


4,387,876

CONSTANT FORCE GENERATOR MECHANISM AND ADJUSTABLE SEAT CONSTRUCTED THEREWITH

Roger H. Nathan, Beersheba, Israel, assignor to Advanced Products Beer-Sheva Ltd., Beer Sheva, Israel

Continuation of Ser. No. 37,172, May 5, 1979, abandoned. This application Jul. 1, 1981, Ser. No. 279,408
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—571 9 Claims



1. A constant force generator mechanism, comprising: a rigid first link adapted to be fixed to a support; a rigid second link mounted for pivotable movement to said first link by a first hinge joint; and a spring link hingedly mounted to said first link by a second hinge joint, and hingedly mounted to said second link by a third hinge joint; said spring link having a linear spring rate and zero free length whereby, upon pivoting the second link with respect to the first link, the spring link generates a force whose component parallel to the first link at any given point on the second link is constant through the entire range of pivotable movement of the second link, said second hinge joint being adjustable on said first link to vary the magnitude of the generated force.

4,387,877

APPARATUS FOR FORMING POOL DECK AND COPING

Max W. Deason, 1818 W. Price St., Tucson, Ariz. 85705

Filed Nov. 17, 1981, Ser. No. 322,390
Int. Cl.³ E04G *11/02*
U.S. Cl. 249—9 11 Claims

1. An apparatus for forming a deck and coping thereof for said pool, said apparatus comprising,

(a) a continuous strip of semirigid material including

(i) a facing surface generally free of adhesive and posi-

tioned below said horizontal edge against said upper portion of said pool wall,

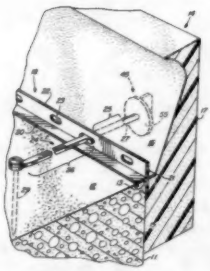
(ii) a front form surface extending upwardly from said facing surface to form a contoured surface for temporarily supporting concrete poured above said horizontal edge onto said bond surface of said pool, said concrete forming a pool deck and coping thereof contiguous to said pool wall when set, and

(iii) a back wall surface generally opposed to said front form surface and facing said central area of said pool;

(b) an elongate support member having a first end, a second end, and a middle section, said support member being shaped such that at least one of said ends can be passed through said continuous strip such that

(i) a portion of said middle section is positioned in said continuous strip between said front form surface and back wall surface thereof,

(ii) said first end is positioned outside said continuous strip adjacent said back wall surface and is adapted to receive and carry a securing member having a surface contoured to fit against said back wall surface of said continuous strip, and



(iii) said second end is positioned outside of said continuous strip adjacent to said horizontal bond surface, and is adapted to be fixedly secured to said bond surface such that at least a portion of said elongate member is in tension when said securing member is carried by said first end thereof and presses against said back wall surface of said continuous strip,

said elongate member and securing member holding said facing surface of said continuous strip in fixed position against said pool wall; and

(c) a supplemental elongate strip positioned on said bond surface along said horizontal termination edge between said bond surface and said upper portion of said pool wall, said supplemental edge strip including an elongate upstanding panel member extending along said bond surface generally parallel to said pool wall, said upstanding panel member including a plurality of spaced apertures formed therethrough,

said middle section of said elongate support member passing through one of said spaced apertures of said supplemental strip.

4,387,878

PILOT OPERATED VALVE ASSEMBLY

Keith E. Zakansky, St. Charles, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 13, 1981, Ser. No. 282,970

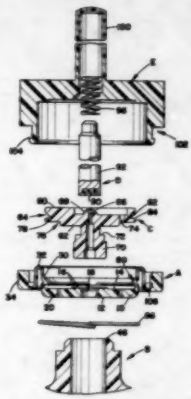
Int. Cl.³ F16K *31/04, 31/40*

U.S. Cl. 251—30 **5 Claims**

1. A diaphram assembly for a pilot operated valve comprising:

a diaphragm insert having a first side, a second side, and a peripheral edge between the first and second sides, means defining a pilot outlet aperture in said insert and a pilot supply aperture extending between the first and second sides; and,

a flexible diaphragm including an annular seat portion having first and second sides, said diaphragm further including a peripheral rim portion and an interconnecting relatively flexible web portion, means defining a shouldered sealing retention surface interconnected between said annular seat portion and said web portion and configured to complement and interengage with said peripheral edge, said first side of said diaphragm disposed adjacent the



insert and said second side of said diaphragm defining a valving surface for engaging a valve seat, at least one fluid supply aperture through said diaphragm and in fluid communication with said pilot supply aperture, means defining a fluid seal radially inwardly of said fluid supply aperture, the interengagement of said shouldered sealing retention surface and said peripheral edge serving to define a seal between said diaphragm and said insert peripheral edge whereby passage of fluids between said insert and said diaphragm is precluded.

4,387,879

SELF-SEALING CONNECTOR FOR USE WITH PLASTIC CANNULAS AND VESSEL CATHETERS

Stefan Tauschinski, Vienna, Austria, assignor to Eduard Fresenius Chemisch Pharmazeutische Industrie KG, Bad Homburg von der Hohe, Fed. Rep. of Germany

Continuation of Ser. No. 30,390, Apr. 16, 1979. This application Jul. 16, 1981, Ser. No. 284,136

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1978, 2817102

Int. Cl.³ F16K *37/28*

U.S. Cl. 251—149.1 **11 Claims**

1. A connector consisting essentially of a hollow longitudinal passage, a hollow body portion containing a chamber, a hollow inlet portion and a hollow outlet portion, said connector containing a longitudinally slidable member, having a central opening, disposed within said longitudinal passage, and slidable within limits in said longitudinal passage, said member contacting and cooperating with a deformable elastomeric disc, having a central slit, disposed and held in place within the chamber of said body portion transversely across said longitudinal passage to close off the passage, said inlet portion having a hollow conical portion adapted to be connected to a parenteral solution supply needle or hose having a cone fitting, said outlet portion having a hollow passage and being adapted to be connected to a cannula, catheter or hose; said longitudinally slidable member cooperating with said cone fitting such that when said cone fitting is inserted into said inlet hollow conical portion the cone fitting contacts and causes the longitudinal

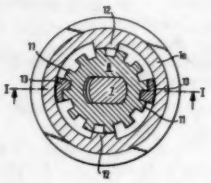
slidable member to advance and protrude at least through part of the elastomeric disc to open the slit in the disc and provide communication between the hollow inlet portion, the chamber in the body portion and the hollow outlet portion, the elastomeric disc providing resilient means such that when the cone fitting is withdrawn from the inlet portion of the connector the disc springs back to its original position closing the slit and sealing the disc and thereby forceably urging the longitudinally slidable member to retract to its original position.

4,387,880

SINGLE-GRIP MIXING VALVE

Risto A. Saarisalo, Kuolimaa, and Jorma T. Koppanen, Rauma, both of Finland, assignors to Oras OY, Rauma, Finland

Filed Oct. 29, 1981, Ser. No. 316,527
Claims priority, application Finland, Oct. 30, 1980, 803407
Int. Cl.³ F16K *51/00*
U.S. Cl. 251—285 **4 Claims**



1. A single-grip mixing valve, which comprises

a first part comprising a valve body;

inlets for hot and cold water and an outlet for mixed water in said body;

ceramic discs fitted inside the body and having openings therein cooperating with the inlets and outlet in the body and with each other in order to regulate the mixing ratio of cold and hot water;

a second part comprising a turning piece fitted for limited turning movement inside the body;

a lever attached with bearings to said turning piece and engaging one of said discs in order to move the same;

axial protrusions provided in the turning piece and in the surrounding body respectively, there being at least one protrusion in one of said parts and several protrusions in the other part, respectively, and the protrusions facing each other radially in a non-overlapping manner; and

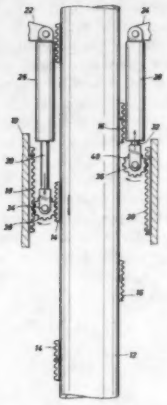
at least one detachable limiting piece being inserted between said parts and engaging the protrusions of one part while radially overlapping the protrusions of the other part in order to provide a selectable limit for the turning movement of the turning piece and, hence, of the lever.

4,387,881

BARGE JACKING APPARATUS

Thomas F. McDuffie, 11926 Taylorcrest, Houston, Tex. 77024

Filed Jul. 2, 1981, Ser. No. 280,062
Int. Cl.³ E02B *17/04*
U.S. Cl. 254—89 H **11 Claims**



1. For use in a barge having a jack-up leg passing through a guide which secures the leg for movement toward or away from the underlying ground support beneath a body of water to raise or lower the barge relative to the body of water, the improved jack-up apparatus comprising:

(a) an elongate rack extending along a barge leg, said rack being intermittently interrupted and having two or more segments which are spaced from one another along the leg and which rack segments are aligned lengthwise with one another with a space between said segments;

(b) a stationary rack segment affixed to said barge, said stationary segment and leg segments being sized and arranged so that a pinion fits therebetween and engages both;

(c) a movable pinion having teeth with a pitch thereon to enable said pinion to engage said stationary segment and said rack segments; and

(d) motor means connecting to said pinion for movement approximately parallel to the axis of said leg to move said pinion while engaging the teeth of said stationary rack to impart relative movement to said segmented rack.

4,387,882

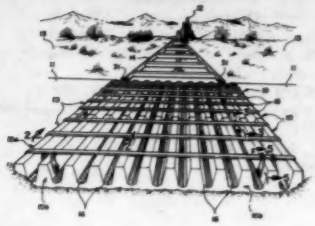
CATTLE GUARD CONSTRUCTION AND METHOD

Alex E. Mansour, 320, Casa Loma La., and Jon D. Bridgwater, 530 S. Casa Loma La., both of Cedar City, Utah 84720

Filed Apr. 27, 1981, Ser. No. 257,888
Int. Cl.³ E01B *17/00*; E01C *5/22*
U.S. Cl. 256—17 **21 Claims**

1. A highway cattle guard, comprising precast, individual, concrete slab sections aligned in end-to-end relationship across a highway as an extension of cattle-confining fencing, each of said sections comprising a side-by-side series of individually formed, trough-like lengths of structural sheet material, each of which is formed to provide an elongate valley member; elongate structural sheet material interconnecting the trough-like lengths as ridges between the valleys thereof and providing up-facing traction surfaces for vehicles crossing the cattle guard transversely of the valleys and ridges; a structural concrete base for each of said sections precast integrally into the reverse valleys formed along the underside of the intercon-

nected lengths and extending thickly below the valleys as a supporting slab base therefor integral with the remainder of



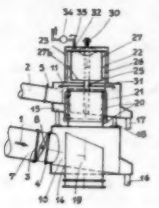
said concrete base; and means securing the interconnecting sheet material in place.

4,387,883

CHANGEOVER DEVICE FOR AN INSTALLATION FOR RECOVERY OF THE GASES AND FUMES PROCEEDING FROM A CONVERTER

Marc Leveques, Moint-par-Montbrison, France, assignor to Clesid S.A., Saint-Chamond, France

Filed Oct. 15, 1981, Ser. No. 311,720
Claims priority, application France, Nov. 21, 1980, 80 24741
Int. Cl.³ C21C 5/40
U.S. Cl. 266—158 6 Claims



1. A changeover device for an installation for recovery of the gases and fumes proceeding from a tilting converter, including an enclosure of dimensions sufficient to accommodate the tilting movements of said converter and enveloping the latter about at least that portion of it which is situated above the horizontal plane containing the axis of tilt when the converter is in its vertical position, a first fixed suction duct called the main suction duct, joined to said enclosure and connected to a suction device enabling suction to be exerted in the enclosure in which the gases escape from said converter, and a second fixed suction duct called the secondary duct for suction above said converter during its pouring or charging phase, connected to the same suction device as the main duct by way of the changeover device which comprises

(a) a suction chamber having two superposed upper and lower portions (10 and 11) connected only through a vertical junction duct (20) projecting into said upper portion (11) of said chamber, an annular tank (21) containing water being arranged about said junction duct (20), said main suction duct (1) opening out into said lower portion (10) of said chamber and said secondary duct (2) opening out into said upper portion (11) of said chamber;

(b) a cylindrical bell (22) movable inside said upper portion (11) of said chamber between a low position in which said bell (22) is plunged into said annular tank (21) surrounding said junction duct (20) and isolates completely said upper portion (10) from said lower portion (11) of said chamber, and a high position in which said bell (22) is disengaged from said annular tank (21), said upper and lower chambers (10 and 11) then being in communication;

(c) means (30) for moving said bell between its low position and its high position; and

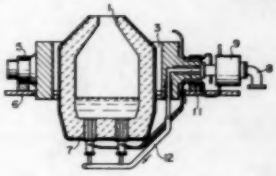
(d) a closure valve (8) in said main suction duct (1) before said chamber the lower portion (10) of which is connected to said suction device.

4,387,884

STRUCTURE OF OXYGEN PASSAGE IN STEEL CONVERTER VESSEL SUPPORTING TRUNNION

Masahiko Seki; Koji Wada, and Yukito Io, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 20, 1982, Ser. No. 341,151
Claims priority, application Japan, Jan. 21, 1981, 56-5779[U]; Jan. 22, 1981, 56-6511[U]; Jan. 22, 1981, 56-6512[U]; Feb. 4, 1981, 56-13654[U]
Int. Cl.³ C21C 5/50
U.S. Cl. 266—246 6 Claims



1. An oxygen passage structure in a supporting trunion for a steel converter vessel, which trunion has a trunion ring with a trunion shaft projecting radially and said shaft having a horizontal opening therein opening out of the end surface thereof, said horizontal opening extending parallel with the axis of the trunion shaft, said trunion further having a vertical opening opening out of the bottom surface of the trunion and having the axis intersecting the axis of said horizontal opening, and said trunion having a hollow chamber therein into which said horizontal and said vertical openings open and which chamber is open through the wall of said trunion ring toward the converter vessel, said oxygen passage structure comprising:

a horizontal pipe inserted in said horizontal opening and being adapted to be connected with a supply pipe;

a vertical pipe inserted in said vertical opening, the vertical pipe being adapted to be connected with an oxygen tuyere in the converter vessel;

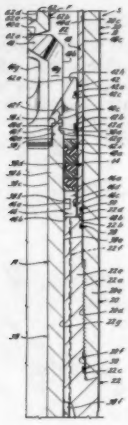
a hollow pipe connecting member having a shape complementary to the shape of said hollow chamber and positioned in said hollow chamber, the end of said horizontal pipe which is toward said chamber being welded to said pipe connecting member and the end of said vertical pipe which is toward said chamber being welded to said hollow pipe connecting member; and

a pipe connector means mounted in said hollow pipe connecting member and having a passage therethrough extending from said horizontal pipe to said vertical pipe for connecting said pipes, said pipe connector means having support means thereon engaged with the inner surfaces of the walls of said hollow pipe connecting member for supporting said passage in a position in said pipe connecting member in which the ends of said passage are aligned with said horizontal and vertical pipes.

4,387,885
SHOCK ABSORBER ASSEMBLY FOR ABSORBING SHOCKS ENCOUNTERED BY A DRILL STRING

Thomas R. Bishop; Roger D. Chancey, and Wayne A. Kovar, all of Houston, Tex., assignors to Bowen Tools, Inc., Houston, Tex.

Continuation of Ser. No. 130,983, Mar. 17, 1980, abandoned.
This application May 7, 1982, Ser. No. 375,962
Int. Cl.³ F16F 9/18; E21B 17/00
U.S. Cl. 267—125 11 Claims



1. A shock absorber assembly for use with a drill string having working fluid therein, comprising:

a body member affixed to the drill string and in communication with the working fluid, said body member formed having a central bore therethough, said body member including a top sub, a middle body, and a spline body;

a mandrel mounted for reciprocal longitudinal movement with respect to said spline body of said body member and for directing the working fluid outwardly from said body member, said mandrel formed having a central bore therethrough;

fluid dampening means floated within said central bore of said body member wherein the working fluid flows about said fluid dampening means;

a mandrel adapter removably mounted with an upper end of said mandrel for engaging said fluid dampening means;

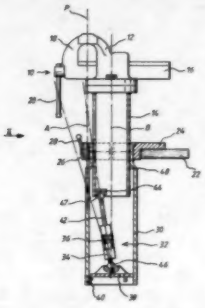
at least two retainer body parts, each of said retainer body parts being formed having at least two retainer rings, at least one of said retainer rings is receivably mounted within a retainer detent formed in said mandrel adapter and at least one of said retainer rings is receivably mounted within a retainer detent formed in said mandrel, said retainer body parts securing said mandrel adapter with said mandrel; and,

said fluid dampening means engaging said mandrel for movement thereof in response to movement of said mandrel for absorbing shocks transmitted between said mandrel and said body member.

4,387,886
VISE WITH ROTATABLE AND VERTICAL ADJUSTMENT

Wolfgang Schlegel, Oehringen; Arthur Wilke, Bad-Friedrichshall-Jagstfeld, and Rolf Birkert, Pfedelbach, all of Fed. Rep. of Germany, assignors to Schlegel GmbH, Oehringen, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 290,950
Claims priority, application Fed. Rep. of Germany, May 2, 1981, 8113061[U]
Int. Cl.³ F16F 9/02; B23Q 1/04
U.S. Cl. 269—71 7 Claims

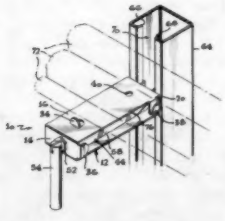


1. A vise comprising a fixed jaw and a movable jaw, a cylindrical support secured to the fixed jaw and depending therefrom, a mounting for attaching the vise to a bench, said mounting comprising a clamping device, a tube accommodating said cylindrical support for rotational and vertical adjustment, said tube being supported and engaged by said clamping device whereby tightening of said clamping device clamps said cylindrical support and vise in place, a gas spring within said tube and acting between said tube and said cylindrical support for exerting an upwardly directed force on said cylindrical support, the portion of the tube engaged by the clamping device having a reduced internal diameter and being slotted in longitudinal direction whereby the cylindrical support engages the tube along this portion of reduced internal diameter only, said portion of reduced internal diameter being formed by a slotted cylindrical insert secured to projecting from the upper end of the tube.

4,387,887
STRUT CLAMP AND TEMPORARY SUPPORT

James C. Gentry, 21461 Encina Rd., Topanga, Calif. 90290

Filed Dec. 8, 1980, Ser. No. 214,081
Int. Cl.³ B23Q 3/02
U.S. Cl. 269—100 2 Claims



1. A strut clamp comprising:

a frame, a front wall on said frame, an opening in said front wall so that a clamp face is defined by said front wall on each side of said opening in said front wall, said clamp

faces facing in a first direction and being for engagement on a strut on opposite sides of an opening in the strut;

a clamp hook assembly movably mounted with respect to said frame, said clamp hook assembly having first and second clamp arms, first and second clamp hooks mounted on said first and second clamp arms, said first and second clamp hooks extending between said clamp faces and facing away from each other, said clamp hooks being positioned so that said first clamp hook faces said first clamp face and said second clamp hook faces said second clamp face so as to clamp a strut against both of said clamp faces, said arms each having an angularly oriented wing thereon so that said first and second clamp hooks are moved closer together as said clamp assembly is moved in said first direction;

tightening means engaged between said frame and said clamp hook assembly for moving said clamp hook assembly in said second direction with respect to said frame to clamp a strut between said clamp hooks and said clamp faces; and

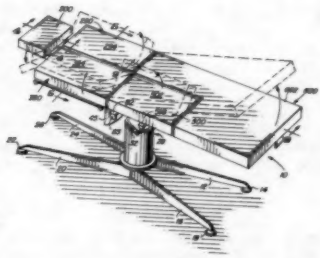
means on said strut clamp for supporting structures which are to be supported with respect to said strut.

4,387,888

TABLE APPARATUS

James Marinakis, 1703 Wilshire Blvd., Santa Monica, Calif. 90403

Filed Jan. 29, 1981, Ser. No. 229,325
Int. Cl.³ A61G *13/00*
U.S. Cl. 269—324 **15 Claims**



1. Table apparatus for supporting a body, comprising, in combination:

frame means, including a central rod;

support means for supporting the frame means;

head supporting means adjustably secured to the frame means for supporting the head portion of the body;

thoracic leaf means, including a first leaf and a second leaf pivotally secured to the central rod and independently movable on the rod to a plurality of positions;

first lock means for locking the first thoracic leaf in any of the plurality of positions and for releasing the first thoracic leaf from a locked position;

second lock means for locking the second thoracic leaf in any of the plurality of positions and for releasing the second thoracic leaf from a locked position;

first release means connected to the first and second lock means for substantially simultaneously releasing the first and second thoracic leaves from their locked positions;

rear frame means secured to and movable on the frame means between an up position and a down position;

third lock means for locking the rear frame means in its up and its down positions;

second release means for releasing the rear frame means from its locked positions;

inomate plate means secured to and movable with the rear frame means and pivotable thereon between a closed position and an open position;

fourth lock means for locking the inomate plate means in the open and in the closed positions; and

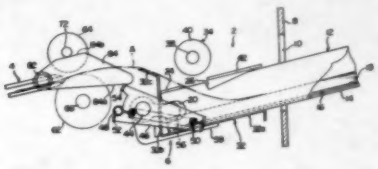
third release means for releasing the inomate plate means from its locked positions.

4,387,889

COPYING APPARATUS PROVIDED WITH A CASSETTE-TYPE PAPER FEEDING MECHANISM

Shigeo Koyama, Toyonaka; Ryutaro Yamagata, Nishinomiya; Nobuhiko Kozuka, Suita, and Hiromi Sakata, Neyagawa, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Jul. 29, 1981, Ser. No. 287,834
Claims priority, application Japan, Aug. 18, 1980, 55-116087[U]
Int. Cl.³ B65H *5/06*
U.S. Cl. 271—10 **5 Claims**



1. A copying apparatus including

a cassette-type paper feeding mechanism having a cassette-receiving section disposed at an upstream end of a copying paper transfer passage defined within a housing and a copying paper cassette to be mounted to the cassette-receiving section through an opening formed in a side wall of the housing, said paper feeding mechanism being constructed such that when the paper cassette is inserted into the cassette-receiving section through the opening of the housing to set it at an inoperative position and further moved in a predetermined direction to set it at an operative position, a paper feeding member provided in the cassette-receiving section acts on a copying paper in the paper cassette to render it ready for feeding into the paper transfer passage, and

a pair of paper transfer rollers provided at that position of the paper transfer passage which is in proximity to the cassette-receiving section, at least one of said paper transfer rollers being mounted movably relative to the other;

said apparatus being characterized in that when the paper cassette is set at the operative position, said one transfer roller is in contact with said other transfer roller, but when the paper cassette is moved from the operative position to the inoperative position, the movement of the cassette is transmitted to said one transfer roller through a motion-transmitting member thereby to separate said one transfer roller from said other transfer roller.

4,387,890

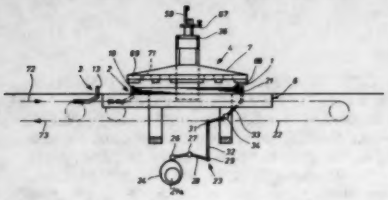
APPARATUS FOR CHANGING THE ORIENTATION OF STACKED PAPER SHEETS OR THE LIKE

Seigfried Lampe, Ellerbek, Fed. Rep. of Germany, assignor to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Jul. 13, 1981, Ser. No. 282,923
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1980, 3026634
Int. Cl.³ B65H *5/00*
U.S. Cl. 271—225 **14 Claims**

1. Apparatus for changing the orientation of sheets, particularly of stacks of overlapping sheets, comprising a support; first conveyor means for supplying sheets to said support; second conveyor means for removing sheets from said support; an orientation changing device mounted at a level above said support and rotatable about a substantially vertical axis; and

means for pneumatically lifting a sheet off said support and for urging the thus lifted sheet against said device so that the lifted



sheet can share the rotary movements of said device about said axis.

4,387,891

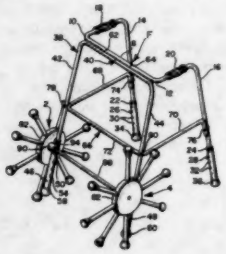
WALKER

E. Stanley Knochel, 4202 Glenmore Ave., Baltimore, Md. 21206

Filed Dec. 2, 1980, Ser. No. 212,113

Int. Cl.³ A61H *3/00*

U.S. Cl. 272—70.3 8 Claims



1. A walker comprising

(a) an upstanding frame including right and left hand support portions

(b) each of said support portions comprising front and rear ground-engaging members for stabilizing the walker

(c) bearing means associated with the lower part of each of said right and left hand support portions

(d) an axle rotatably carried by said bearing means spanning said support portions, and

(e) a hub fixedly secured to each end of said axle

(f) said front ground-engaging members including a plurality of equally spaced spokes extending radially outwardly from said hub

(g) the spokes on one hub being substantially one-half step out of phase with the spokes on the other hub, whereby, when one of the spokes of said one hub is substantially perpendicular to, and in engagement with the ground, two of the spokes of said other hub are angularly disposed to, and in engagement with, the ground so that the walker can be stably advanced in stepwise increments in response to downward forces alternately applied by the patient to the right and left hand support portions of the frame.

4,387,892

KENDO DUMMY WITH OSCILLATING SWORD

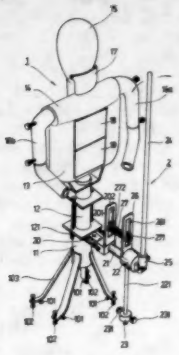
Cheng C. Wen, No,. 653, Ta Kan Liau, North Area, Tainan City, Taiwan

Filed Sep. 28, 1981, Ser. No. 306,109

Claims priority, application Taiwan, Jul. 17, 1981, 7012136

Int. Cl.³ A63B *69/00*

U.S. Cl. 272—76 6 Claims



1. A kendo dummy comprises

a trunk means provided with a throat piece, a breast plate and a stomach plate

a supporting frame to support a trunk means thereon; and

an oscillating means connected to said trunk means by means of a stationary member, said oscillating means comprising a shaft secured to said stationary member, an oscillating arm pivotally mounted on said shaft, a suspending bar extending downward from said oscillating arm, a weight fastened to said suspending bar, a torsion spring extending from said stationary member to said oscillating arm, and a bamboo sword connected to said oscillating arm.

4,387,893

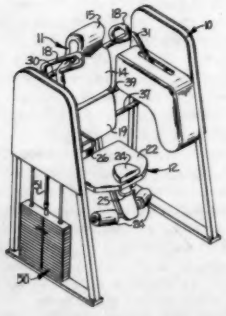
ABDOMINAL WEIGHT LIFTING APPARATUS

Dan D. Baldwin, Independence, Va., assignor to Nautilus Sports/Medical Industries, Inc., Lake Helen, Fla.

Filed May 6, 1981, Ser. No. 261,260

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—118 10 Claims



1. Apparatus for exercising abdominal muscles and comprising:

means for supporting a user's body and including upper torso engaging means and lower torso engaging means,

means mounting said body supporting means for pivotal move-

ment of said upper torso engaging means and said lower torso engaging means one relative to the other about an axis extending transversely of the user's body along a line passing through the user's body below and adjacent the sternum and forward of and adjacent the spine, and

resistance means operatively connected to said body supporting means for imposing force resisting movement to said upper torso engaging means and said lower torso engaging means when one of said upper torso engaging means and said lower torso engaging means moves away from the other,

said body supporting means and said mounting means cooperating for isolating the abdominal muscles of the user's body and for exercising such abdominal muscles against the force imposed by said resistance means.

4,387,894

BENCH-TYPE EXERCISER DEVICE

Rene Baumann, Lucerne, Switzerland, assignor to Wilhs AG, Kriens, Switzerland

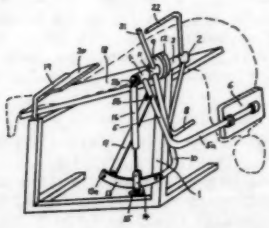
PCT No. PCT/CH80/00108, § 371 Date May 29, 1981, § 102(e) Date May 29, 1981, PCT Pub. No. WO81/00967, PCT Pub. Date Apr. 16, 1981

PCT Filed Sep. 18, 1980, Ser. No. 269,022

Claims priority, application Switzerland, Oct. 3, 1979, 8892/79

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—130 **5 Claims**



1. A bench-type exerciser device particularly useful in exercising the back muscles of a user, said exerciser device including a frame means; a support means mounted on the frame means on which a user can lie; a bearing fixedly mounted on the frame means near a first end of the support means; a shaft rotatably mounted in the bearing; a first lever rotatably mounted on the shaft, said first lever including an arm portion which is positionable beyond said first end of the support means; a pad swivelably mounted on the arm portion of the first lever for contact with the back of a user; a second lever, a first end of said second lever being mounted on the shaft; a connecting member, a first end of said connecting member being rotatably connected to said first lever; an arcuate lever arm, one end of said arcuate lever arm being rotatably connected to the second end of said second lever and the opposite end of said arcuate lever arm being rotatably connected to the second end of said connecting member; an elongated resisting means, one end of said elongated resisting means being rotatably connected to the shaft and the opposite end of said elongated resisting means being adjustably connectable along the length o the arcuate lever arm, said elongated resisting means acting to resist movement of said arcuate lever arm; and means for locking said second lever with respect to rotation about the shaft, its angular position about the shaft altering the initial positioning of said first lever and thus the location of the pad relative to said first end of the support means.

4,387,895

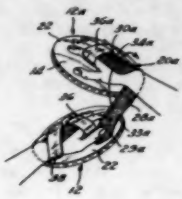
HAND RACKET

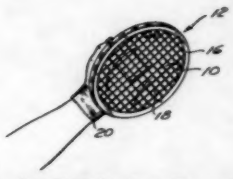
Charles F. Steel, 17202 Sandree Lee La., Huntington Beach, Calif. 92649

Filed Sep. 25, 1981, Ser. No. 305,495

Int. Cl.³ A63B *59/00*

U.S. Cl. 273—67 B **8 Claims**





8. A hand racket adapted to be easily secured to the hand even when a similar racket is secured to the opposite hand, comprising:

a concave base for engagement with the palm of the hand, the rear surface of said base being provided with a non-slip material and the rim of said base forming a mouth;

a racket face attached to said base and covering said mouth for resilient contact with a ball; and

a strap attached to said base for securing said racket to the hand, said strap comprising:

a first portion including means for securing the racket to the middle fingers of the hand while leaving the thumb and small finger free to grip said base;

a second portion including means for adjustably securing the racket to the base of the hand or wrist; and

a third portion interconnecting said first and second portions of said strap and including means for adjustably achoring said second portion to said base.

4,387,896

SLIDABLE GOLF PRACTICE DEVICE

John P. O'Brien, 175 E. Delaware Pl., Chicago, Ill. 60611

Continuation-in-part of Ser. No. 195,403, Oct. 9, 1980, Pat. No. 4,311,312, which is a continuation-in-part of Ser. No. 35,605, Apr. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 932,563, Aug. 10, 1978, abandoned. This application Jul. 21, 1981, Ser. No. 285,585

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—195 A **9 Claims**

1. A golf practice device adapted to be disposed on a horizontal surface, said device comprising:

a stationary, horizontal, rectangular frame;

a golf ball hitting surface slidably positioned within said frame;

a static surface adapted to support said hitting surface;

said frame comprising two side rails and two end rails, with

said hitting surface disposed therebetween but spaced from said end rails;

said side rails spaced apart from said static surface thereby forming slot means generally aligned with the direction of the line of flight of the golf ball to be struck from said hitting surface; and

said slot means adapted to cooperate with and frictionally engage the sides of said hitting surface to retain said hitting surface within said frame and to permit said hitting surface to slide horizontally over said static surface within said frame and provide a uniform resistance against displacement when a golf ball is struck from the hitting surface and thereafter permit said hitting surface to be manually returned to its original position.

4,387,897

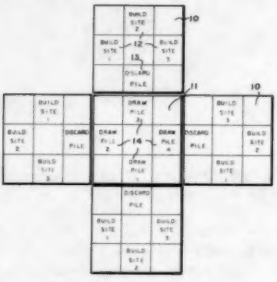
GAME APPARATUS

Cyril F. Andersen, 1491 Ute Dr., Salt Lake City, Utah 84108

Filed Apr. 14, 1978, Ser. No. 896,608

Int. Cl.³ A63F 3/00

U.S. Cl. 273—276 **15 Claims**



1. Game apparatus, comprising a set of a plurality of playing pieces for each player, each piece of the set being of similar geometric shape in one plane but each being of different perimetral size in that plane so that beginning with the piece of largest perimetral size, all of the individual pieces of a set can be stacked to form a shape of progressively diminishing cross section, said pieces of one set being interchangeable with similarly sized pieces of each of the other sets; means for holding all playing pieces so that they may be drawn individually from such means to be placed into play; and playing board means having thereon for each of a plurality of players four designated sites for placement of playing pieces, three of which sites are labeled to indicate they are construction sites and the fourth of which is labeled to indicate that it is a discard site.

4,387,898

BALL GAME APPARATUS AND METHOD

U. Stancel Mangum, 838 E. 6600 South, Murray, Utah 84107

Filed Jul. 28, 1981, Ser. No. 287,868

Int. Cl.³ A63B 71/02, 59/02, 63/04

U.S. Cl. 273—411 **14 Claims**

1. Ball game apparatus comprising

a generally horizontally disposed playing floor having first and second oppositely located ends,

at least two self-propelled vehicles for operating on the playing floor by at least two players of opposite teams, each vehicle including

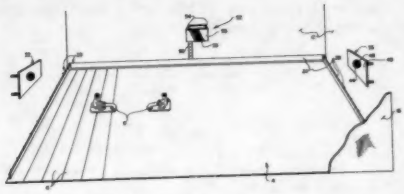
a frame having a front end,

one or more wheels mounted to support the front end of the frame and to contact and roll along the playing floor, said one or more wheels being pivotable about a generally vertical axis to guide the vehicle, and

crank means rotatably mounted in the frame and coupled to said one or more wheels to cause the wheel to pivot as the crank means is rotated, said crank means including a handle for grasping by one hand of a player to rotate the crank means,

first and second target means positioned above the playing floor at the first and second ends thereof respectively, each target means including

a generally flat, rigid sheet of material having an opening located therein, said opening being large enough to allow passage of at least a portion of a ball therethrough, said sheet of material being mounted above and generally perpendicularly to the floor at a respective end thereof,



a target element positioned behind the opening in the sheet of material so that the target element is contacted when at least a portion of a ball passes through the opening, and

means for producing a visual or audible signal, or both, in respose to the target element being contacted by a ball,

at least two scoop means for use by at least two corresponding players for catching and throwing a ball, each scoop means including a handle portion by which the scoop means may be held, and a cup portion for receiving and holding a ball, and from which a ball may be thrown, and

a ball for use by players in attempting to hit the targets to thereby score points.

4,387,899

DUAL CHAMBER SEALING ELEMENT WITH HARDENING FILLER

Anders I. Dahlberg, Flyghamnsvägen 22, S-183 64 Täby, Sweden

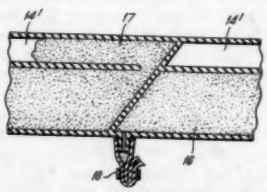
PCT No. PCT/SE80/00276, § 371 Date Jul. 7, 1981, § 102(e) Date Jul. 7, 1981, PCT Pub. No. WO81/01452, PCT Pub. Date May 28, 1981

PCT Filed Nov. 6, 1980, Ser. No. 285,073

Claims priority, application Sweden, Nov. 15, 1979, 7909418

Int. Cl.³ F16J 15/46; F16L 17/02

U.S. Cl. 277—34.3 **8 Claims**



1. A sealing element comprising a flexible member adapted to be desposed in a slit-shaped, preferably annular space, which member comprises an internal gas-filled cavity with an inlet on one end for a hardening filling medium intended to be introduced into said cavity under pressure so that the cavity is filled and the member expands so that the gap is sealed, characterized in that the cavity (2) in the flexible member extends from the inlet (10) such as to embrace the space (24, 30, 42) which shall be sealed and thereafter continues in a closed chamber (14) adapted to receive the gas which is driven out of said cavity (2) in the flexible member when the cavity (2) is filled

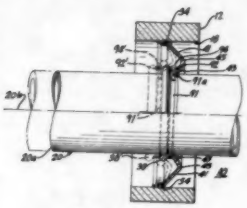
with filling medium (16), so that the displaced gas can be compressed in the closed chamber (14') and exert a counter pressure on the filling medium (16') in the flexible member while the filling medium is hardening.

4,387,900

METHOD AND APPARATUS FOR PROVIDING WATERTIGHT SEAL FOR MANHOLE PIPE CONNECTION

Jack Ditcher, Langhorne, and James A. Westhoff, Huntington Valley, both of Pa., assignors to A-Lok Products, Inc., Tullytown, Pa.

Filed May 5, 1982, Ser. No. 375,181
Int. Cl.³ F16J 15/52
U.S. Cl. 277—101 **25 Claims**



1. A gasket assembly for resiliently supporting a pipe within an opening and for sealing the annular region between the outer surface of the pipe and the surface of the opening, comprising:

a gasket formed of a resilient, compressible material and having an outer flange adapted to be positioned against the opening in which the gasket is placed;

said gasket having a central opening defined by an annular shaped peripheral portion of substantially circular cross-section;

an intermediate, substantially V-shaped, folded section comprised of first and second webs joined to one another along a common annular fold and further integrally joined respectively to said outer flange and said inner annular portion;

an annular clamping band formed of a plastic material substantially impervious to corrosive influences normally encountered in sewage systems and arranged to be positioned against the inner periphery of said flange;

said clamping band having a discontinuity and including an insertable segment positioned within the gap formed by said discontinuity when the clamping band is expanded against said outer flange to lock said clamping band and maintain said outer flange under compression, the interactive forces between the compressed flange and the clamping band serving to retain the clamping band and insertable segment in a locked position against the inner periphery of said flange, the outer periphery of said flange being pressed into intimate engagement with the surface of said opening.

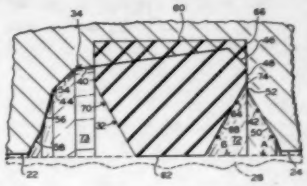
4,387,901

RETRACTION SEAL FOR A DISC BRAKE WITH ANTI-NIBBLING FEATURE

Irving R. Ritsema, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 8, 1982, Ser. No. 355,999
Int. Cl.³ F16J 15/18, 9/20
U.S. Cl. 277—165 **8 Claims**

1. A retraction seal for a disc brake wherein a caliper defines a bore for receiving a piston, the bore includes a groove for receiving the retraction seal in an installed condition so that the latter sealingly engages the caliper and the piston, characterized by said retraction seal defining an outer diameter in its free state which is greater than an outer diameter defined by the groove, said retraction seal defining an inner diameter in its free state which is substantially equal to an outer diameter defined by the piston, the groove including a forward surface having a first portion extending substantially normal to the direction of movement for the piston during braking and a second portion extending substantially from an inner diameter of the groove to define a first angle relative to the normal direction, said retraction seal including a forward wall facing said forward surface, said forward wall including an inner section opposite said second portion which defines a second



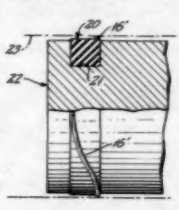
angle relative to the normal direction and said first angle is substantially equal to said second angle which is about, the bore receiving the piston to deform said retraction seal into the groove whereby said inner section and said second portion cooperate to define a spacing which permits deformation of said retraction seal into said space during braking in order to generate a resilient restoring force biasing the piston into the bore upon termination of braking, said retraction seal being deformed during braking to move axially into said spacing which is large enough to receive said deformed retraction seal and prevent full engagement between said inner section and said second portion.

4,387,902

ELASTOMERIC SEAL RING WITH SELF-LUBRICATING WEAR-REDUCING FEATURE

Charles E. Conover, Mountain Lakes, N.J., assignor to C. E. Conover & Co., Inc., Fairfield, N.J.

Filed Oct. 19, 1981, Ser. No. 312,775
Int. Cl.³ F16J 15/32
U.S. Cl. 277—203 **11 Claims**



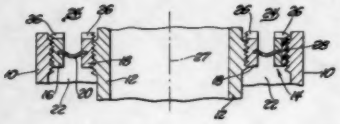
1. An elastomeric seal ring adapted for stressed retention in a conventional O-ring circumferential groove in one of two relatively rotatable members and for establishing a sealed interface to a circumferentially continuous wiping-contact area of the other rotatable member in the course of relative rotation, said ring comprising an integral annular body containing elastomeric material as an essential ingredient and configurated for substantially complete conformance with the walls of the groove, said body having a uniform rectangular radial-section profile throughout the region thereof which is adapted for retained reception in the groove of the one member thus exposing a body surface of substantially groove width for circumferentially continuous confronting relation to the wiping-contact area of the other member, said body surface being characterized by a rib of width substantially less than the groove width,

said rib continuously undulating as a function of azimuth about the body axis and between limits established by the overall width of the groove, and said rib projecting radially from the exposed body surface as the sole feature of said ring in contact with the wiping-contact area of the other rotatable member.

4,387,903
ANNULAR SEAL

Roger R. Smith, Lapeer, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 6, 1981, Ser. No. 251,610
Int. Cl.³ F16J 15/32; B23Q 17/00
U.S. Cl. 277—212 FB **1 Claim**



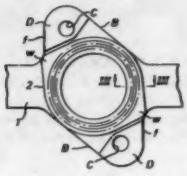
1. In the combination comprising a first hollow cylindrical member having a relatively large inner diameter, and a second cylindrical member having a relatively small outer diameter; said second member being disposed within the first member: the improvement comprising an improved sealing assembly for the annular joint between the two members; said sealing assembly comprising first screw threads formed on the inner surface of the outer member, and second screw threads formed on the outer surface of the inner member; a first annular ring having threads on its outer surface for meshed engagement with the first screw threads, a second annular ring having threads on its inner surface for meshed engagement with the second screw threads; and an annular flexible membrane having its outer and inner edges permanently affixed respectively to the first and second rings; the pitch of the first and second screw threads being the same; the first and second rings having their thread lead-in surfaces arranged so that the rings can be simultaneously screwed onto the threads on the outer and inner cylindrical members; both of said rings having wrench-engagement indentations in their corresponding end faces for simultaneous interaction with a turning implement, whereby the rings are turned together through similar angular distances during installation or removal of the sealing assembly to or from the defined annular joint; the inner diameter of the first ring being substantially greater than the outer diameter of the second ring, whereby the second cylindrical member can have substantial radial play within the first cylindrical member; said first and second screw threads being formed on radially-aligned areas of the cylindrical members whereby the first and second rings are in substantial radial alignment with one another, to thus minimize axial space required to mount the sealing assembly.

4,387,904
GASKETS

Terence P. Nicholson, Calf Hall, Muggleswick, Derwentside, County Durham, England

Filed Feb. 26, 1981, Ser. No. 238,616
Int. Cl.³ F16J 15/08
U.S. Cl. 277—235 B **4 Claims**

1. A gasket for sealing a joint between a cylinder head and an exhaust manifold, comprising a sheet metal base layer having openings therein corresponding to the number of cylinder head and exhaust manifold exhaust ports around which a seal is required, a second layer applied to the base layer having a radially corrugated metal annulus for each opening, with the radially inner parts of each annulus spaced apart from the base layer around the corresponding opening, and a sheet metal layer effectively increasing the thickness of the base layer in

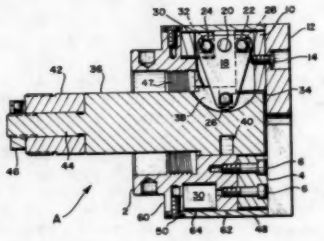


regions of the base layer surrounding securing stud apertures therein.

4,387,905
MACHINE TOOL CHUCK

Ivan R. Brown, Breesport, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Nov. 28, 1980, Ser. No. 211,339
Int. Cl.³ B23B 31/14
U.S. Cl. 279—1 C **9 Claims**



1. A multi jaw rotary chuck for lathes and the like, comprising:

a. a body having front and rear portions and including a bore;

b. a plurality of spaced jaw guides in said front portion of said body;

c. a plurality of moveable master jaw supports for the jaws of said chuck;

d. said jaw guides each having one of said master supports slideably guided thereby;

e. a plurality of actuator plates in said body each mounted in spaced radial planes intersecting and parallel to the axis of said bore and each actuator plate having first, second and third apexes;

f. said first apex of each plate having a hole and including a first dowel pin mounted in said hole and extending outwardly on either side thereof transverse to the plane of its respective plate;

g. said second apex of each plate having a hole and including a second dowel pin mounted in said hole and extending outwardly on either side thereof transverse to the plane of its respective plate and generally parallel to said first dowel pin;

h. pivot means on each of said actuator plates journaled in said body and positioned between its respective first and second dowel pins;

i. a moveable arcuate counterweight for each of said actuators operably connected to said first dowel pin and supported on the rear portion of said body;

j. said second dowel pins each operably connected to one of said master jaw supports;

k. a moveable draw plug extending into said central bore and including actuator plate engaging means;

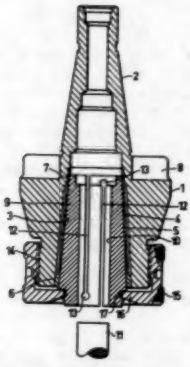
l. said third apex of each of said actuator plates operably connected to said actuator plate engaging means;
m. said draw plug includes an inner end portion;
n. said inner end portion positioned within said body;
o. said inner end portion includes an annular slot;
p. said inner end portion includes arcuate longitudinal slots intersecting said annular slot for receiving the third apex of each of said actuator plates; and,
r. whereby upon moving said draw plug rearwardly relative to said body, said actuator plates pivot about said pivot means and simultaneously shift said master jaw supports and said counterweights to maintain positive grip on work when said body is rotated.

4,387,906

TOOL OR WORKPIECE CHUCKING DEVICE

Curt Nicolin, Grödinge, Sweden, assignor to Eminentverktyg A.B., Eskilstuna, Sweden

Filed Oct. 17, 1980, Ser. No. 197,934
Claims priority, application Sweden, Oct. 19, 1979, 7908691
Int. Cl.³ B23B *31/20, 31/30, 31/40*
U.S. Cl. 279—2 A **5 Claims**



1. A chucking device for a tool or workpiece having a cylindrical or slightly conical chucking surface comprising (a) a body, which is provided with a truncated cone-shaped surface, (b) a cavity located in said body inside of said cone-shaped surface of said bodies and along a substantial portion of the axial extension of said cone-shaped surface of said body and (c) a fluid-utilizing pressurizing member located in said body, by means of which member said cavity can be subjected to pressure as desired by means of said fluid, and (d) a holder for the tool or workpiece which is provided with a surface having a cone-shaped shape substantially corresponding to that of said body, a cylinder-shaped surface concentric with said cone-shaped surface of said holder, and with slits open at one end and extending through the wall of said holder, and (e) a clamp ring, which can be screwed on threads arranged in said body concentrically with said cone-shaped surface of said holder for causing said cone-shaped surface of said holder to contact said cone-shaped surface of said body.

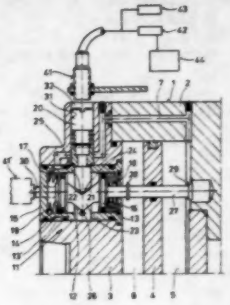
4,387,907

DEVICE FOR CONTROLLING A WORKING MACHINE

Karl Hiestand, Pfullendorf, Fed. Rep. of Germany, assignor to SMW Schneider & Weissbaupt GmbH, Fed. Rep. of Germany

Filed Jun. 13, 1980, Ser. No. 159,384
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924111
Int. Cl.³ B23B *31/28, 31/30*
U.S. Cl. 279—4 **11 Claims**

1. In combination with a working machine of the type having a chuck body including a rotary chuck cylinder closed by a cylinder cover to define a substantially closed pressure space, and a chuck piston slidably disposed in the pressure space for displacement responsive to a fluid pressure in the pressure space, a source of fluid under pressure, and means for providing fluid communication between the source and the pressure space, an improved device for controlling the working machine, comprising: a pulse generator member axially guided within the chuck body in communication with the pressure space for movement responsive to the fluid pressure at a predetermined level and axially displaceable into an end position; switching means provided outside of the chuck body at a spaced location therefrom for switching the machine off; stop



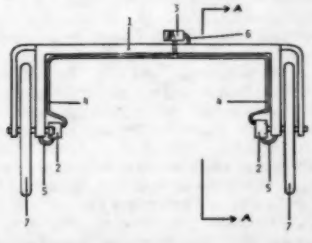
means connected to said pulse generator and engageable by the chuck piston near end position of the chuck piston so that said pulse generator is also responsive to chuck piston position; and a control member displaceably mounted in the chuck body operative to interconnect said pulse generator member and said switching means, whereby, the control member is displaceable upon movement of said pulse generator member into said end position to actuate said switching means to switch off the machine; said pulse generator member including piston means having a piston portion slidably guided in the cylinder cover operatively loaded by the fluid pressure in the pressure space and spring means for biasing said piston portion into an equilibrium position.

4,387,908

TROTTER EXERCISING CART

Tapani Kroger, 79899 Liukonpelto, and Raimo Luostarinen, 79330 Nasdanmaa, both of Leppavirta, Finland

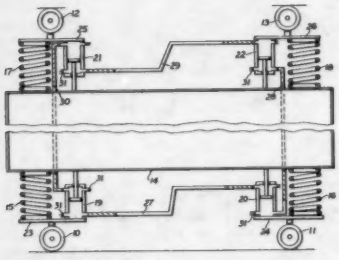
Filed May 1, 1981, Ser. No. 259,405
Int. Cl.³ B62C *1/08*
U.S. Cl. 280—63 **1 Claim**



1. A trotter exercising cart braking system comprising:
an oil-tight hollow cart frame;
a pair of cart wheels having axles rotatably attached to said frame;
a pair of hydraulic pumps fixedly attached to said frame and operably connected to a respective axle;

a pair of supply pipes connected between respective pumps and said frame;
an adjustable hydraulic valve;
a pressure pipe connected between said pumps and said valve; and
a return pipe connected between said valve and said frame, whereby oil circulating through said system presents a resistance to said wheels turning, depending on the adjustment of said valve.

4,387,909
SUSPENSION SYSTEMS
Murashiki-Job C. Takavarasha, 24 Carlyle Rd., Edgbaston, Birmingham B16 0BJ, England
Filed Jan. 7, 1981, Ser. No. 222,983
Claims priority, application United Kingdom, Jan. 10, 1980, 8000845
Int. Cl.³ B60G 11/26
U.S. Cl. 280—104 9 Claims



1. A suspension system for a member which is supported at a number of spaced locations by fluid actuated units at each of said locations, each unit defining a pair of chambers to contain fluid, with changes in volume in said chambers under changing load conditions resulting in an element of said unit moving relative to said member, said element being connected to means for supporting member, and the chambers of the units at the respective positions being interconnected so that fluid acting in one unit to move said element thereof in one direction produces movement of an element in an adjacent or opposite unit in the same direction, said interconnection existing between the units in a closed circuit, characterized by each of said units including a cylinder and first sealing means secured therein,

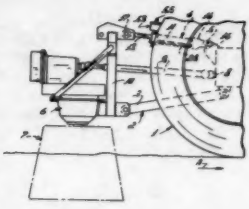
said each unit further including a piston rod slidably engaged within said first sealing means and carrying thereon spaced apart second and third sealing means, said second and third sealing means each slidably engaging the inner wall of said cylinder at locations above and below, respectively, said first sealing means to thereby define a pair of fluid-containing chambers within said cylinder separated by said first sealing means,

said piston rod passing through both said chambers and extending from one of said second or third sealing means outward from said cylinder through an open end thereof on one side of said one sealing means secured in said cylinder,

the volumes of said chambers changing inversely equally as the piston rod moves relative to said cylinder in response to said changing load conditions,

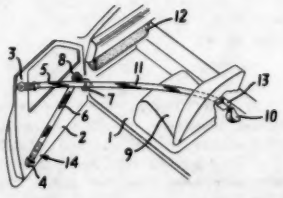
said interconnection between the units comprising pipe means, a first chamber on one side of said first sealing means in one cylinder being connected by said pipe means to a second chamber on the correspondingly opposite side of said first sealing means in the cylinder of an adjacent unit, said second chamber on said correspondingly opposite side of said adjacent unit being connected by said pipe means to a third chamber on the correspondingly opposite side of said first sealing means in the cylinder of another adjacent unit, said fluid in said chambers being incompressible.

4,387,910
COUPLING MEMBER
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland
Continuation of Ser. No. 910,903, May 30, 1978, abandoned.
This application Oct. 15, 1980, Ser. No. 197,341
Int. Cl.³ B60D 7/02
U.S. Cl. 280—449 11 Claims



1. An overload strut member adapted to be connected between two elements, said member comprising a cylinder, means adapted to connect said cylinder to one of said elements, a solid piston received within said cylinder that defines two fluid spaces within said cylinder, means adapted to connect said piston to the second of said elements, hydraulic means retaining said piston and cylinder in a relatively fixed position to establish the overall set length of said strut member until overload, said hydraulic means including a hydraulic passageway interconnecting said spaces and a one way pressure relief valve in said passageway, said piston having a rod that extends through a first of said spaces and a reservoir being in communication with said first space, said relief valve opening responsive to a predetermined hydraulic pressure in said second space to permit the sliding movement of said piston within said cylinder and change in the length of said member, and bypass valve means for selectively allowing hydraulic flow between said spaces to vary the overall set length of said member when open and to lock said cylinder at a fixed length when closed, said relief valve allowing movement only when said predetermined pressure is exceeded.

4,387,911
SEAT BELT SYSTEM USING LAP BELT HAVING ENERGY ABSORPTION CAPACITY
Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo-to, Japan
Filed Jan. 28, 1980, Ser. No. 115,783
Claims priority, application Japan, Mar. 8, 1979, 54-27372
Int. Cl.³ B60R 21/10
U.S. Cl. 280—802 6 Claims



1. In a three-point passenger restraint belt system supported by anchor means at upper and lower locations outboard of a vehicle seat and a location inboard of the seat, said system

comprising a continuous belt passed through a coupling ring at an intermediate portion of said belt, one side of said coupling ring being slidable on the continuous belt and defining the juncture of a waist belt portion and a shoulder belt portion, the other side of said coupling ring being attached to a retractile belt wound on an emergency locking retractor attached to said inboard anchor means, the improvement wherein the waist belt includes means for absorbing the kinetic energy of the occupant during an initial part of the time of a vehicle collision for initially restraining the waist of the passenger until a predetermined load is exerted on the waist belt, for thereupon permitting the waist portion of the passenger to move forwardly in the vehicle a predetermined distance, and for thence again restraining the waist of the passenger, said energy absorption means comprising a portion of the waist belt that passes through the lower outboard anchor means and is superposed upon and attached to an incoming portion to form a double-belt portion, a portion of each belt length of said double-belt portion being unattached to the other such portion, and each of the unattached belt portions of the double-belt portion being folded into a U-shaped loop and stitched by rows of stitching which break at said predetermined waist belt load and thereby permit each said loop to unfold and extend the length of the waist belt.

4,387,912

SEATBELT SYSTEM

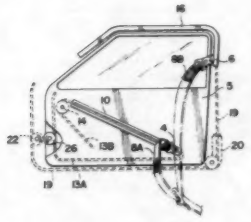
Shigeru Moriya; Akio Yoshida, both of Toyota; Koichi Tanaka, and Yuji Nishimura, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, both of Aichi, Japan

Filed Oct. 5, 1981, Ser. No. 308,939

Claims priority, application Japan, Oct. 14, 1980, 55-145863[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **14 Claims**



1. A seatbelt system comprising:

a first guide rail provided on a roof side;

a first sliding member slidably secured to said first guide rail and connected thereto with one end of a shoulder webbing;

a second guide rail provided on the inner side surface of a door;

a second sliding member slidably secured to said second guide rail and connected thereto with one end of a lap webbing;

a first rotatable member secured to a vehicle body and rotatable in operational association with the movement of said first sliding member;

a second rotatable member rotatable in operational association with said second sliding member and provided on the door so as to engage said first rotatable member when the door is closed whereby movement of said first sliding member requires movement of said second sliding member; and

driving means for moving said first and second sliding members.

4,387,913

NO-CARBON COPYING PAPER

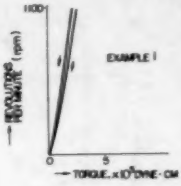
Takahiro Torii, Hyogo, and Hideaki Senoh, Takasago, both of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 3, 1981, Ser. No. 299,225

Claims priority, application Japan, Sep. 9, 1980, 55-125014

Int. Cl.³ B41M *5/22*

U.S. Cl. 282—27.5 **7 Claims**



1. Pressure sensitive no-carbon copying paper composed fundamentally of a color former sheet produced by coating a support with microcapsules containing a colorless electron-donative organic compound as a color former and a color developer sheet produced by coating a support with a coating color containing activated clay as a color developer which adsorbs the aforesaid electron-donative organic compound to develop color, wherein the aforesaid activated clay-containing coating color is prepared by adding a polyvinyl alcohol, a styrene-butadiene latex and an emulsion of wax which is solid at room temperature to activated clay.

4,387,914

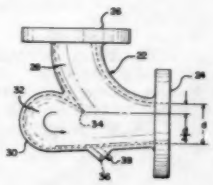
SHORT RADIUS, LOW WEAR ELBOW

Jerome I. Paulson, Landisville, and Larry W. Hess, Harrisburg, both of Pa., assignors to Hammertek Corporation, Harrisburg, Pa.

Filed Jun. 8, 1981, Ser. No. 271,122

Int. Cl.³ F16L *55/00*

U.S. Cl. 285—119 **10 Claims**



1. In a fluent material handling system, an elbow means for effecting small radius turns without excessive wear, velocity reduction and particle breakage, said elbow means comprising:

an annular entry port;

an annular exit port;

a continuous annular channel extending between said ports in an arc; and

a chamber formed on the outer wall on the outer arc of said channel opposite said entry port, said chamber opening into said channel on one side tangential to said channel wall with the other side of said chamber merging with said outer wall at a point outwardly offset parallel to the central axis of said inlet port by one quarter the diameter of said channel.

4,387,915

EXHAUST SYSTEM PIPE AND EXHAUST SYSTEM WITH SUCH A PIPE

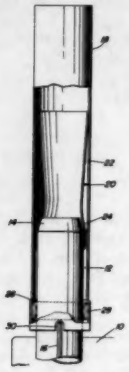
Henning Adickes, Heidelberg, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 164,364, Jun. 30, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 383,677

Claims priority, application United Kingdom, Jul. 26, 1979, 7926043

Int. Cl.³ F16L *9/22, 27/12*

U.S. Cl. 285—330 **10 Claims**



1. An exhaust pipe assembly comprising:

a first pipe;

a second pipe receiving the first pipe and having an inner diameter larger than the outer diameter of the first pipe;

a separate tubular member disposed within and attached to the second pipe, the tubular member having an abutment surface for engaging a corresponding abutment surface of the first pipe, the first pipe abutting the abutment surface of the tubular member; and

a spacer member fixed to the second pipe in a spaced apart relationship to the tubular member and engageable with the first pipe, the spacer member and the tubular member cooperating with the pipes to prevent contact therebetween.

4,387,916

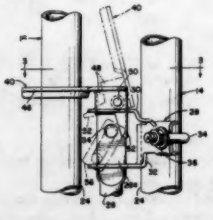
GATE LATCH ASSEMBLY

George O. Lening, 4535 Elm St., Chino, Calif. 91710, and James B. Lening, 705 Locust, Ontario, Calif. 91761

Filed Jun. 26, 1980, Ser. No. 163,095

Int. Cl.³ E05C *3/06*

U.S. Cl. 292—5 **3 Claims**



1. A latch assembly for a hinged double gate structure including a pair of hinged gates swingable to and from a closed position wherein the gates are disposed in substantially coplanar relationship with a vertical edge of a first gate adjacent to a vertical edge of a second gate, comprising:

a normally generally vertical latch rod having a normally upper generally planar end portion,

mounting bracket means slidably receiving said rod including means for attaching said bracket means to said vertical edge of the first gate with said rod extending along said vertical edge of the first gate, said mounting bracket means including first and second members each having portions disposed about said generally planar upper end portion of said rod at axially spaced sections thereof, each of said members defining a slot dimensioned and configured for engagement with the upper end portion of said rod,

anti-rotation means for restraining said rod against rotation on its longitudinal axis relative to said bracket means,

a latch yoke having a tongue portion and a pair of spaced yoke arms extending from the tongue portion,

means pivotally connecting said yoke tongue to said rod on a pivot axis which is transverse to said rod for pivotal motion of said yoke between a gate latching position wherein said yoke arms extend transversely of said rod and straddle said edge of the second gate and a gate releasing position wherein said yoke arms extend generally longitudinally of said rod,

means for latching said latch yoke and latch rod in latching position, said yoke latching means comprising at least one elongated bifurcated arm extending from said latch yoke, and disposed in one of said mounting bracket member slots, and

said yoke latching means including a hole in the normally upper end portion of said rod for receiving a lock over which said one elongated arm passes when said yoke tongue is moved between the gate latching position and the gate releasing position, said bifurcated arm being pivotally connected to said upper end of the rod and having elements on opposite sides thereof extending at least partly therearound.

4,387,917

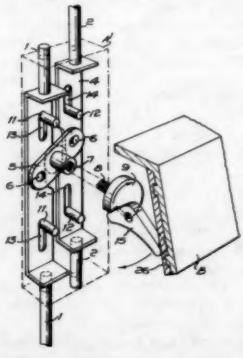
PANIC BOLT UNITS

Michael J. Cocker, Stockport, England, assignor to Peter George Legg and Melvyn Alan Tindall, both of Lancaster, England

Filed Dec. 26, 1979, Ser. No. 107,434

Int. Cl.³ E05C *15/02*

U.S. Cl. 292—40 **5 Claims**



1. A door lock and panic bolt unit release mechanism comprising a box section member mounted in a door and housing two vertically sliding bolts adapted to move in opposite directions, a pair of U-shaped slotted plates to which the bolts are respectively secured, pegs extending from the box section

member and passing through the slots in the slotted plates, a T-member on pins projecting from the slotted plates a spindle non-rotatably connected to the T-member, a cam onto the spindle, and a lever engaging the cam and by which the cam is rotated by pressure to release the bolts from a door.

4,387,918

DEADLOCK MECHANISM

Gerald F. Dunphy, Glen Waverley, and Hans J. Esser, Keysborough, both of Australia, assignors to Ogden Industries Pty. Ltd., Huntingdale, Australia

Continuation-in-part of Ser. No. 123,068, Feb. 20, 1980, abandoned. This application Feb. 28, 1980, Ser. No. 126,948
Claims priority, application Australia, Feb. 28, 1979, PD7850
Int. Cl.³ E05C *3/16*; E05B *65/06*
U.S. Cl. 292—224 **7 Claims**

1. Deadlock mechanism including a housing, a deadbolt pivotally mounted on said housing for movement between an operative position and an inoperative position, a front portion of said deadbolt projecting out of said housing in said operative position and being substantially contained within said housing in said inoperative position, a cavity formed in a rear portion of said deadbolt, two side walls of said deadbolt each defining a respective side of said cavity, a slot formed in each said side wall and extending from an edge thereof towards said deadbolt pivotal mounting, a drive arm mounted on said housing for rotation about an axis substantially parallel to the pivotal axis of said deadbolt and projecting into said cavity, a coupling pin extending from each of two opposite sides of said drive arm and slidably located within a respective one of said slots each said coupling pin remaining within its respective slot in both said positions of the deadbolt, and actuator means operable to cause rotation of said drive arm in either of two directions whereby each said coupling pin is engaged with a side of the respective said slot to urge said deadbolt to move about said pivotal mounting, further comprising a biasing spring which is substantially located within said cavity and acts between said deadbolt and said drive arm in a manner such that during movement of said deadbolt from one said position to the other, said spring first functions to resist movement of said drive arm in the direction corresponding to the movement of the deadbolt and subsequently functions to assist movement of said drive arm in that direction.

4,387,919

PORTABLE AUXILIARY DOOR LOCK

Laythol W. Quaintance, Rte. 1, Box 20, Florence, Ariz. 85232, and Dennis W. Quaintance, 714 Francis King St., Greensboro, N.C. 27410

Filed Sep. 8, 1981, Ser. No. 300,435
Int. Cl.³ E05C *19/18*
U.S. Cl. 292—296 **14 Claims**

1. A portable auxiliary door lock adapted for use with a door and an associated door jamb having a striking plate opening and comprising:

a relatively thin, elongate locking plate including a protruding portion proximate one end thereof defining an anchor to be received in the striking plate opening;

a main body portion having a first end formed with a door-engaging face adapted to bear against a marginal portion of a door, said main body portion including a sleeve slidably receiving said locking plate for reciprocal movement thereof with respect to said body portion;

means for controlling the relative reciprocal movement between said locking plate and main body portion and for applying a force to place the door-engaging face and anchor in locking engagement with the door and striking plate, said means comprising:

an elongate member having first and second ends, the first end thereof being pivotably mounted to said locking

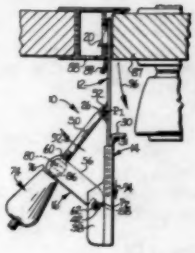


plate for pivotal movement about a first pivot axis and in a pivot plane substantially normal to the plane of the locking plate;

a connector member having first and second ends, the first end thereof being pivotably mounted to said main body portion for pivotal movement about a second pivot axis such that said connector member pivots in substantially the same plane as the pivot plane of said elongate member, the second end of said connector member being connected to said elongate member adjacent said second end thereof to define a connection point;

said first and second axes being respectively positioned such that pivotal movement of said elongate member and connector member in a direction to move said door engaging face and anchor into locking engagement with the door and striking plate, results in said connection point passing through a dead center position to lock the same while permitting the quick release thereof.

4,387,920

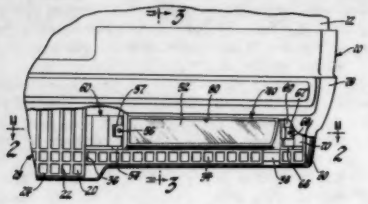
CELLULAR ENERGY ABSORBING BUMPER AND LAMP ASSEMBLY MOUNTED THERETO

Ronald W. Slaughter, Pendleton, and David L. Carpenter, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 6, 1981, Ser. No. 260,882
Int. Cl.³ B60R *19/08*
U.S. Cl. 293—117 **5 Claims**

1. A bumper assembly for a wheeled vehicle comprising energy absorbing media having at least two laterally spaced sections and each section having a plurality of walls of a resilient plastic material that cooperate to form a plurality of cells of a predetermined depth for deflecting and dissipating impact loads applied thereto, said sections being separated from one another to provide a spacing of predetermined dimension therebetween, a frangible lamp assembly adapted to be mounted within said space and directly to said sections of said media, first live hinge means of resilient plastic material securing one end of said lamp assembly to said first section of said media, second live hinge means of resilient plastic material

securing another end portion of said lamp assembly to said second section of said media, at least one of said live hinge means having spaced first and second leg portions respectively joined to said one of said sections and to said lamp assembly



which close toward one another in response to an impact load directed onto said cells of at least one of said sections of said media to permit the movement of said lamp assembly and thereby prevent portions of said media from contacting and damaging said lamp assembly.

4,387,921

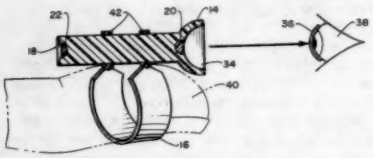
CONTACT LENS APPLICATION

Joseph G. Licata, 2495 Queensbury, Pasadena, Calif. 91104

Continuation of Ser. No. 101,428, Dec. 10, 1979, abandoned. This application May 18, 1981, Ser. No. 264,836

Int. Cl.³ A61F 9/00

U.S. Cl. 294—1 CA **11 Claims**



1. A contact lens applicator comprising:

an elongated shaft;

a first concave cup on one end of said elongated shaft; said first concave cup being substantially larger than the average contact lens;

a second concave cup on the other end of said elongated shaft; said second concave cup being substantially smaller than the average contact lens;

target means centrally located in each of said first and second concave cups;

said elongated shaft and said first and second concave cups being constructed of a stiff material;

whereby said first concave cup can be used with a wetting solution to remove a contact lens from the eye, said second concave cup can be used with a wetting solution to place a contact lens in the eye, said target means serving as a focal point during the removal or placement of a contact lens so that removal or placement can be accomplished without the use of a mirror.

4,387,922

CARRYING HANDLE

Wolfgang G. Geisinger, 352 Rosemere Blvd., Rosemere, Quebec, Canada (J7A 2T5)

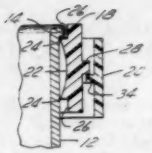
Filed Jun. 4, 1981, Ser. No. 270,648

Claims priority, application Canada, Mar. 23, 1981, 373599

Int. Cl.³ A47J 45/00; B65D 25/28; A47G 29/02

U.S. Cl. 294—31.2 **7 Claims**

1. A handle structure comprising a continuous band adapted to be stretched to extend circumferentially of a container, a handle member integrally connected to said band at a pair of spaced locations and extending part way around the circumference of said band a projection in the form of a rib extending radially outwardly and circumferentially of said band, a tab projecting inwardly from said handle at a position between



said locations located to cooperate with said projection, said projection being radially spaced inwardly of said tab when said band is in a relaxed condition prior to being applied to said container and, said tab being in a position to engage said projection when said band is in stretched condition encircling said container.

4,387,923

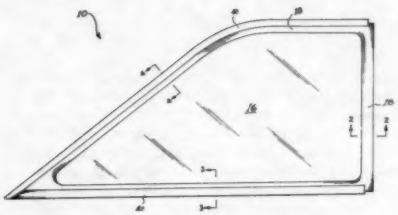
VEHICLE WINDOW ASSEMBLY

David Choby; James Crawford, and James Mariel, all of Elkhart, Ind., assignors to Excel Industries, Inc., Elkhart, Ind.

Filed Oct. 26, 1981, Ser. No. 315,248

Int. Cl.³ B60D 27/04

U.S. Cl. 296—201 **1 Claim**



1. A window assembly used in a vehicle window opening defined by a peripheral flange forming a part of the vehicle body, said window assembly comprising a glazing panel and a resilient enclosing frame, said frame having a recess in one side, said glazing panel at its peripheral edge fitting into said frame recess, said frame including three fingers, each finger separated by a channel at the opposite side of the frame from said recess therein, a first and second of said fingers being flexible and separated by first said channel, said second and a third of said fingers being separated by a second said channel, said window opening flange fitting into said first channel of the frame with said second finger thereof being flexed into liquid sealing contact with said vehicle body, said third finger including a decorative trim piece embedded in said frame at one end and extending downwardly and below said third finger and bearing against said vehicle body at its other end, said trim piece contacting said body at a location spaced from the place of contact of said body and second finger.

4,387,924

COMBINATION BACK PACK AND SEAT

Frank J. Fernandez, P.O. Box 348, Sound Beach, N.Y. 11789

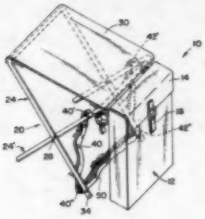
Filed Nov. 3, 1980, Ser. No. 203,648

Int. Cl.³ A47C 9/10, 7/62

U.S. Cl. 297—188 **7 Claims**

1. The combination back pack and seat comprising, in combination, a back pack portion comprising receptacle means for

storing items therein; a seat portion fixedly connected to said back pack portion; and means for fixedly connecting said back pack and said seat portion to each other, whereby two modes of operation are provided, the first as a back pack and the second as a seat, said seat portion comprising first and second bent-leg portions, each being pivotally connected to the other to pivot in a scissor-like manner, each said bent-leg portions being U-shaped and having a pair of vertical legs interconnected by a horizontal bight portion, the horizontal bight portion of said first bent-leg portion being coupled to the rear surface of said back pack portion, first and second shoulder



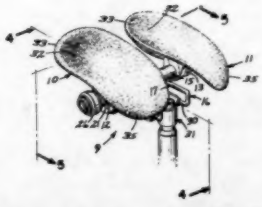
straps for use during the back pack mode of operation of the combination, said first shoulder strap having a first end fixedly connected to one vertical leg of said first bent-leg portion adjacent to its interconnection to its horizontal bight portion, and a second end connected to its pivotally connected vertical leg of said second bent-leg portion adjacent the free end thereof, and said second shoulder strap having a first end fixedly connected to the other vertical leg of said first bent-leg portion adjacent to its interconnection to its horizontal bight portion and a second end connected to its pivotally connected leg of said second bent-leg portion adjacent to the free end thereof, whereby the back pack may be carried by a person.

4,387,925

BICYCLE SEAT

Joel A. Barker, West St. Paul, Minn., and Jeffrey Birch, Charlotte, N.C., assignors to J. B. Two Corporation, Minneapolis, Minn.

Filed Jun. 30, 1980, Ser. No. 164,697
Int. Cl.³ B62J *1/00*
U.S. Cl. 297—201 **3 Claims**



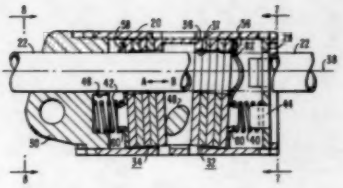
1. A bicycle seat including a pair of support platforms and means for mounting said support platforms on a bicycle, each of said platforms being a mirror image of the other, each of said support platforms including an upwardly facing cup-like portion for supporting engagement with one of a bicycle rider's buttocks and a convex downwardly and forwardly extending portion for supporting engagement with the upper leg portion of the rider, said support platforms being pivotable with respect to each other, whereby a person riding a bicycle including said seat may sit with one buttock resting in each cup-like portion and one upper leg portion resting on each of said convex portions and whereby the rider may pedal the bicycle with the rider's weight consistently and uniformly distributed along each of said cup-like portions and convex portions.

4,387,926

SEAT POSITIONER

Richard L. Van Eerden, Ann Arbor; Norman D. Vial, Jr., Brighton, and Irvin L. Slane, Chelsea, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 26, 1981, Ser. No. 277,776
Int. Cl.³ A47C *1/027*
U.S. Cl. 297—375 **9 Claims**



1. A seat-positioning mechanism of the type including an elongated housing having a rod slidably received therein for movement in either direction with respect to said housing with friction lock means received in said housing, said friction lock means having a locked position canted about a fulcrum to be in frictional engagement with said rod, thereby frictionally restraining said rod against movement in at least one direction with respect to said housing, and an unlocked position wherein said friction lock means is disposed substantially perpendicular to said rod and out of frictional engagement therewith to permit free movement of said rod with respect to said housing to any selected position and biasing means operatively connected to said friction lock means to urge said friction lock means toward the locked position and cam means capable of canting said friction lock means into said unlocked position; wherein the improvement comprises a positioning element located between said friction lock means and said biasing means, said positioning element capable of preventing movement of said friction lock means along said rod in said canted position upon actuation of said cam means.

4,387,927

CHAIR MADE FROM A GARBAGE CAN

Robert E. Fahey, 5248 Raintree La., Naples, Fla. 33942

Filed Feb. 23, 1981, Ser. No. 236,666
Int. Cl.³ A47C *1/12*
U.S. Cl. 297—445 **5 Claims**

1. A novel chair made from a conventional garbage can comprising:

a frustoconical metal can having a flat circular bottom, upwardly flaring frustoconical sides and an open top and having an original capacity in the order of 30 gallons, said can being modified by cutting away a portion of its upper half and leaving at least 50% of the upper half of said can to form the curved back of said chair,

a circular member mounted in a horizontal plane within said

can just below the cut-away portion of the can to support the seat of said chair, and

a cushion of substantially the same diameter as said circular member positioned upon said member to serve as the seat of said chair.

4,387,928

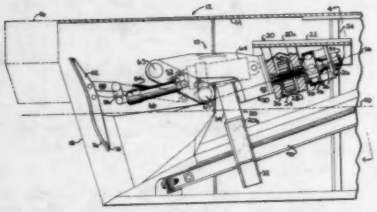
TUNNEL EXCAVATOR

Richard W. Stevens, Milwaukee, Wis., assignor to Milwaukee Boiler Manufacturing Co., Milwaukee, Wis.

Filed Mar. 27, 1981, Ser. No. 248,328

Int. Cl.³ E21D *9/08*

U.S. Cl. 299—33 14 Claims



1. An excavator for excavating the work face of a tunnel, said excavator being suitable for use in a tunneling shield having a hull locatable in the tunnel, said excavator comprising:

support means mountable on said hull for positioning the excavator therein;

an excavating implement appliable to the work face of the tunnel;

a frame having a rearward end mounted on said support means, said frame having portions extending toward the work face of the tunnel, said portions being spaced from, but lying generally parallel to, the axis of the tunnel and terminating in a forward end of said frame;

a link having a first end pivotally mounted on the forward end of said frame, said link being pivotable between first and second positions, in said first position a second end of said link lies adjacent said frame member portions intermediate said forward and rearward ends of said frame and between said frame member portion and the tunnel axis, in said second position said second end of said link extends in front of said forward end of said frame;

a dipper arm having one end pivotally mounted on said second end of said link and the other end pivotally mounting said excavating implement; and

drive means for pivoting said link, dipper arm, and excavating implement.

4,387,929

MILLING ROLLER MOUNTING SUPPORT ON MILLING MACHINES FOR MILLING ROAD SURFACES

Reinhard Wirtgen, Hohner Strasse, 5461 Windhagen, Fed. Rep. of Germany

Filed Feb. 26, 1981, Ser. No. 238,378

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1980, 3049318

Int. Cl.³ E01C *23/09*

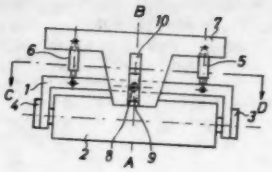
U.S. Cl. 299—39 8 Claims

1. A milling roller mounting support for milling machines used for milling road surfaces, said milling roller having an axis and spaced opposite axial ends and said mounting support comprising

a chassis having two substantially parallel guide surfaces located behind each other in the direction of movement, said chassis having a substantially vertical groove formed in a surface thereof;

a pair of vertically adjustable supports mounted on said chassis; and

a frame positioned at substantially right angles to the direction of movement and supported in said chassis by said supports in a manner whereby said frame is guided by said guide surfaces, wherein said milling roller is tiltingly



supportable at its end via said supports, said frame having a nose extending substantially at right angles to the axis of said milling roller and extending into said groove of said chassis for guiding said frame.

4,387,930

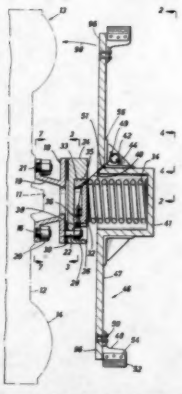
VEHICLE TRACTION DEVICE

Milby N. Hunt, 19 Manor Way, Galveston, Tex. 77550

Filed Oct. 14, 1980, Ser. No. 196,346

Int. Cl.³ B60B *15/00*

U.S. Cl. 301—46 13 Claims



10. A removable traction device for mounting on the wheel of a vehicle, comprising:

a disc;

means for mounting said disc to the wheel of a vehicle comprising adapter means for attachment to the wheel, and a horizontally disposed, cylindrical coil spring extending between and attached to said adapter means and the central portion of said disc, said spring being aligned generally coaxially and longitudinally with the rotational axis of said wheel and permitting said disc to cant relative to said wheel;

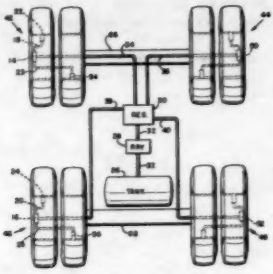
traction means mounted on said disc, and traction means having a first flexible terrain engaging position and a second rigid terrain engaging position, said traction means having a generally flat, terrain-engaging surface in said second position;

means for conveniently moving said traction means between said first and second positions.

4,387,931
TIRE PRESSURE CONTROL IN A VEHICLE

William M. Bland, Willingboro, N.J., assignor to The Budd Company, Troy, Mich.

Filed Apr. 13, 1981, Ser. No. 253,703
Int. Cl.³ B60T 7/12; B60C 23/10
U.S. Cl. 303—1 12 Claims



1. In combination with a vehicle having a plurality of rotatable wheels with air pressurized tires thereon,

means for equalizing and maintaining a predetermined level of uniform air pressure in said tires comprising:

(a) a source of pressurized air;

(b) a pressure regulator for regulating air pressure at said predetermined level of uniform air pressure,

(c) said pressure regulator having inlet means and a plurality of outlet means;

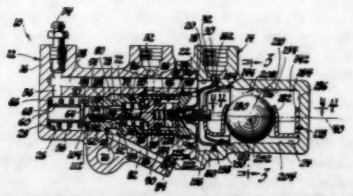
(d) means for applying pressurized air from said source of pressurized air to said inlet means of said regulator to provide said predetermined level of uniform air pressure at said plurality of outlet means; and

(e) means for applying said predetermined level of uniform air pressure through said outlet means to said tires of said vehicle to maintain the pressure in said tires at said predetermined level of uniform air pressure.

4,387,932
PRESSURE PROPORTIONER

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 17, 1981, Ser. No. 255,100
Int. Cl.³ B60T 8/26
U.S. Cl. 303—24 F 9 Claims



1. A brake fluid pressure proportioner having a housing with a brake actuating pressure inlet and a brake actuating pressure outlet, said proportioner comprising:

a pressure proportioning section having at least one pressure proportioning device normally positioned in a non-proportioning mode, and means responsive to brake actuating pressure to move said at least one proportioning device into its proportioning mode;

normally open valve means including a valve and a valve seat, brake actuating fluid under pressure flowing from said inlet to said outlet through said valve means when brake actuating pressure is supplied at said inlet while no proportioning action of said proportioning device is required, so as to bypass the proportioning mode of said at least one proportioning device and deliver the inlet brake actuating pressure to said outlet;

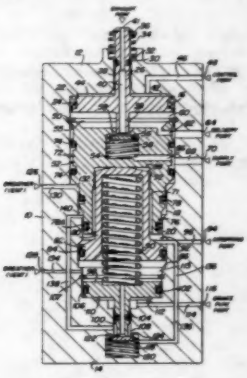
means moving said valve into engagement with said valve seat to close said valve means when proportioning action of said at least one proportioning device is to be initiated, said means including an inertia sensitive device causing initial movement of said valve toward said valve seat, and means directing fluid flow energy in brake fluid under brake actuating pressure flowing toward said valve seat to accelerate movement of said valve to close said valve means by engaging said valve seat, said valve being moved by the flow energy only after said valve has been moved toward said valve seat in response to inertia;

and means directing brake actuating pressure from said inlet to said at least one proportioning device when said valve means is closed, said at least one proportioning device then proportioning brake actuating pressure to said outlet at at least one predetermined proportioning ratio.

4,387,933
RELAY-LOAD/RATIO VALVE FOR USE IN BRAKE APPLICATIONS ON AIR-SPRING EQUIPPED VEHICLES

Christopher A. Cripe, Coatesville, Pa., assignor to The Bi-Modal Corporation, Greenwich, Conn.

Filed Oct. 5, 1981, Ser. No. 308,378
Int. Cl.³ B60T 8/18
U.S. Cl. 303—22 A 12 Claims



1. In a vehicle having air spring wheel suspensions and pneumatic brake cylinders, a control valve to limit maximum brake cylinder pressure in accordance with vehicle load comprising a casing having upper and lower closures, a bore therein and control, delivery, supply, and air spring ports and breather vent, a relay piston slidable in the upper end portion of the bore having a hollow valve stem extending through the upper closure to exhaust, a first chamber above said relay piston communicative with said control port, a load-limiting piston slidable in said bore beneath said relay piston, the space between said pistons constituting a second chamber communicative with said delivery port, a third chamber within said load-limiting piston including a spring-urged check valve therein, means forming communication between said third chamber and said supply port, said hollow valve stem of said relay piston including a portion extending inwardly into said second chamber adapted to engage said check valve, return spring means normally pulling said hollow stem and relay piston upwardly so that said inwardly extending portion of said hollow stem is disengaged from said check valve to allow air present in said second chamber to vent to atmosphere upon

brake release, said load-limiting piston including a hollow center beneath said third chamber including an upper surface and opening through the lower end of said load-limiting piston and forming a fourth chamber communicative with said air spring port, a minimum application bias piston in said hollow center, spring means normally urging said bias piston upwardly towards said upper hollow center surface, and a fifth chamber beneath said bias piston communicative with said breather vent, whereby on service brake application in a fully loaded vehicle, air spring pressure enters said fourth chamber exerting a downward force on said bias piston against action of its spring means to move said bias piston out of contact with said load-limiting piston and supply air stops in said third chamber, and upon brake application in said fully loaded vehicle control pressure via said control port enters said first chamber above relay piston moving said relay piston and its hollow stem downward to contact and unseat said check valve allowing supply air in said third chamber to enter said second chamber and out said delivery port to said vehicle brake cylinders, and for service application in an empty vehicle; the air spring pressure in said fourth chamber is lower and the upward force on said load-limiting piston is proportionally lower so that should control pressure in said first chamber above said relay piston cause delivery pressure in said second chamber below said relay piston to exceed a predetermined pressure, pressure in said second chamber will exert a force downwardly on said load-limiting piston and move it away from said relay piston and its hollow stem closing said check valve to prevent the control valve from responding to further increase in control pressure.

4,387,934

ANTI-SKID BRAKING SYSTEMS FOR VEHICLES

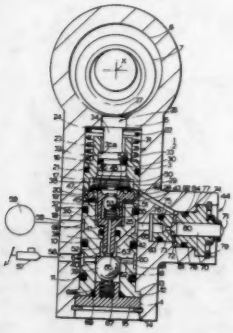
Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries, Limited, Birmingham, England

Filed Jun. 22, 1981, Ser. No. 275,669

Claims priority, application United Kingdom, Jul. 8, 1980, 8022282

Int. Cl.³ B60T *8/087*

U.S. Cl. 303—116 **14 Claims**



1. An anti-skid braking system for a vehicle comprising a brake circuit including a wheel brake, an hydraulic master cylinder connected to said brake circuit, a modulator assembly comprising a housing having a first bore, a reservoir piston, a reservoir space bounded by said reservoir piston, and a dump valve responsive to a skid signal for dumping fluid from said brake circuit to said reservoir space, a pump for recovering fluid from said reservoir space and comprising a pump displacement member, a pump chamber bounded by said pump displacement member, and driving means for said pump displacement member, an inlet passage to said pump chamber from said reservoir space, and an outlet passage from said pump chamber to said brake circuit, said reservoir piston being slidable in said first bore and being provided with a second bore, said pump chamber being provided in said second bore in said reservoir piston, and said pump displacement member being sealed to the wall of said second bore.

4,387,935

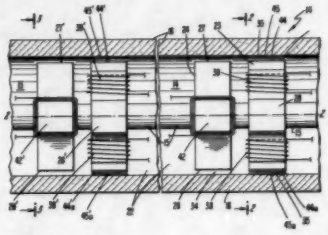
LINEAR MAGNETIC BEARING

Philip A. Studer, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 8, 1980, Ser. No. 214,361

Int. Cl.³ F16C *39/00*

U.S. Cl. 308—10 **52 Claims**



1. A linear magnetic bearing or an electromotive machine including a linear magnetic bearing, said bearing having mutually orthogonal x, y and z axes and comprising a stator member stationary relative to said axes and having a longitudinal axis on the z axis, a member movable relative to said axes, said members being mechanically free of each other, said movable member adapted to have a longitudinal axis along the z axis, permanent magnet means on one of said members for positioning the movable member in a plane defined by the x-y axes relative to the stationary member, means for sensing the position of the movable member relative to the stationary member in the plane defined by the x-y axes, electro-magnet means on one of said members responsive to the sensing means for centering the longitudinal axis of the movable member on the z axis, a radial air gap being established between said members in the plane defined by the x-y axes, said members including means for establishing first low reluctance magnetic flux paths for the permanent magnet means through both of the members and the air gap and second low reluctance magnetic flux paths for the electro-magnets through both of the members and the air gap so that no net force is applied to the movable member in the direction of the z axis by either the permanent magnet means or the electromagnet means, said permanent magnet means having high magnetic reluctance compared to the flux paths, said first and second low reluctance flux paths being arranged so that flux from the electro-magnet means do not pass through the permanent magnet means.

4,387,936

MAGNETIC BEARING FOR HIGH-SPEED ROTATION

Tadao Ishizawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Sep. 24, 1981, Ser. No. 305,364

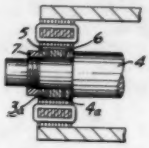
Claims priority, application Japan, Oct. 9, 1980, 55-144183[U]

Int. Cl.³ F16C *39/00*

U.S. Cl. 308—10 **6 Claims**

1. A rotor armature assembly for an electromagnetic radial bearing for use in high rotational speed applications, the rotor armature assembly comprising: a rotary shaft, a plurality of annular magnetic plates each comprised of soft magnetic material and disposed in axial alignment on the rotary shaft, and means including a plurality of annular steel reinforcing plates each comprised of material having greater mechanial strength

than the soft magnetic material of said magnetic plates and disposed on the rotary shaft between some of the annular magnetic plates and in frictional engagement therewith for



frictionally restraining radial outward deformation of the annular magnetic plates due to centrifugal force during high speed rotation of the rotor armature assembly.

4,387,937

BEARING ASSEMBLY FOR ROTOR CENTERING DEVICE

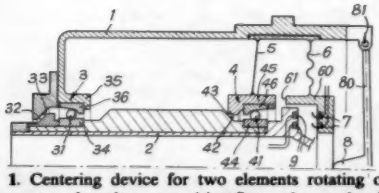
Jean-Pierre Fournier, Ecos, and Jacques Cabillic, Gaillon, both of France, assignors to Societe Europeenne de Propulsion, Puteaux, France

Filed Feb. 12, 1981, Ser. No. 233,905

Claims priority, application France, Feb. 19, 1980, 80 03624

Int. Cl.³ F16C *21/00, 39/02*

U.S. Cl. 340—682 **11 Claims**



1. Centering device for two elements rotating one with respect to the other, comprising first and second radial bearings, both situated at a distance from one another along the axis of the rotor and each constituted by first and second opposing centering members with angular contact between inner and outer faces, device wherein for each radial bearing the first and second opposing centering members with angular contact between inner and outer races, adapted to exert by their opposing opposite forces along the rotation axis, are mounted with axial clearance so that when one of said members is in abutment, the other member has a radial clearance and reciprocally the first angular contact centering members of the first and second bearings are also opposing, and the second angular contact centering members of the first and second bearings are likewise opposing, so that by relative axial movement of the inner and outer contact races of both first and second centering means belonging to the two bearings, simultaneous contact of the inner and outer races is achieved either with the first centering members or with the second centering members which happen to be opposing on the two bearings, thereby transferring all the load either on the first centering members or on the second centering members.

4,387,938

ROLLING BEARING INCORPORATING DAMPING MEANS

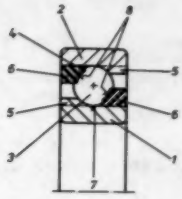
Manfred Brandenstein, Eusenheim; Horst M. Ernst, Eltingshausen, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 19, 1981, Ser. No. 245,278

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 8008532

Int. Cl.³ F16C *27/04, 33/60, 33/76*

U.S. Cl. 308—184 R **3 Claims**



1. A rolling bearing assembly comprising at least a pair of race rings having confronting spaced raceways and a plurality of rolling elements in the annular space between the race rings and a plurality of elastically flexible discrete damping elements mounted at circumferentially spaced locations in at least one of the race rings, each damping element anchored against rotation in a recess in an annular radially projecting shoulder of said one ring defining the raceway, said damping elements projecting a predetermined distance into the area of the raceway to frictionally engage the rolling elements and provide a predetermined resistance to rolling.

2. A rolling bearing assembly comprising at least a pair of race rings having confronting spaced raceways and a plurality of rolling elements in the annular space between the race rings and elastically flexible damping means comprising a plurality of elastic damping elements projecting a predetermined distance into the area of the raceway to frictionally engage the rolling elements and provide a predetermined resistance to rolling, said damping elements being anchored against rotation in axially extending recesses formed in an annular radially projecting shoulder of at least one of the rings defining the raceway providing a positive locking of the damping elements against movement circumferentially relative to the ring and wherein said damping elements are interconnected to form a continuous annular member having a projection engaging the opposing ring to provide a seal.

4,387,939

MULTI-PART ROLLING BEARING CAGE WITH SNAP FIT INTERCONNECTION

Lothar Walter; Armin Olschewski; Klaus Kispert, all of Schweinfurt, and Hans Meining, Dittelbrunn, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 29, 1981, Ser. No. 287,900

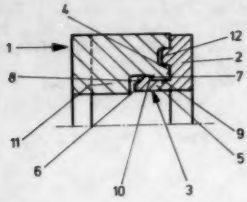
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1980, 8020776[U]

Int. Cl.³ F16C *33/46*

U.S. Cl. 308—217 **9 Claims**

1. A multi-part cage for the rolling elements of a rolling bearing, comprising first and second adjoining cage parts having central bores, said first part having axially extending recesses at its inner surface, said second part having axially extending projections received in said recesses, said recesses and projections having engaging radially extending surfaces inhib-

iting separation of said first and second parts, said first and second parts having further mutually engaging axially extend-



ing recesses and projections spaced from the inner circumference thereof.

4,387,940

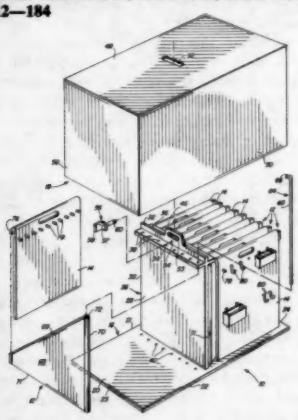
APPARATUS FOR SUPPORTINGLY ORGANIZING AND DISPLAYING MISCELLANEOUS ARTICLES

Earl E. Chandler, P.O. Box 1624, Coolidge, Ariz. 85228

Continuation-in-part of Ser. No. 123,387, Feb. 21, 1980, Pat. No. 4,273,394, which is a continuation-in-part of Ser. No. 937,543, Aug. 28, 1978, Pat. No. 4,225,202. This application Jan. 29, 1981, Ser. No. 229,339

Int. Cl.³ A47B *63/00*; A47F *5/08*; A47B *96/06*

U.S. Cl. 312—184 8 Claims



1. An apparatus for supportingly displaying miscellaneous articles in organized arrays comprising:

(a) a box including,

I. a base having a floor with a transverse upstanding central wall,

II. a cover demountably mounted on said base for enclosing said base,

(b) at least a pair of cantilever arm means each having an elongated horizontal top edge and an elongated vertical side edge;

(c) means on the upstanding central wall and in the floor of said base and on said pair of cantilever arm means for demountably and pivotably mounting said pair of cantilever arm means in said box so that the elongated vertical side edge of one of said pair of cantilever arm means lies along a first vertical axis which is adjacent one side of the upstanding central wall of said base and the elongated vertical side edge of the other of said pair of cantilever arm means lies along a second vertical axis which is adjacent the other side of the upstanding central wall of said base, said pair of cantilever arm means being pivotably movable about their respective ones of said first and said second vertical axes;

(d) a display panel means demountably suspended from each of said pair of cantilever arm means; and

(e) fastener means on said display panel means for demountably supporting miscellaneous articles thereon in organized arrays.

4,387,941

WORK PLACE ARRANGEMENT

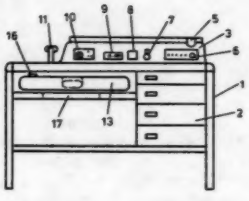
Klaus Maier, Heidenheim, Fed. Rep. of Germany, assignor to Strohm & Maier Labormobel GmbH, Heidenheim, Fed. Rep. of Germany

Filed Oct. 10, 1980, Ser. No. 196,151

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1979, 2944671

Int. Cl.³ A47B *77/08*

U.S. Cl. 312—194 8 Claims



1. In a work place arrangement which comprises a workbench including at least one attached board, at least one drawer, at least one arm rest, at least one working instrument or tool, and supply lines for said working instruments or tools, the improvement wherein:

(a) said attached board is adapted to receive said working instruments or tools and to incorporate supply lines for said working instruments or tools, so received

(b) said arm rests comprise a left half and a right half which together form a counter portion firmly affixed on the front side of said bench at ergonomic height below the bench top main work surface, and including

(c) a suction device having a suction opening located in said arm-rests unit, centrally thereof, between said left and right arm rest halves of said counter portion and a push-button control located on the top side of said counter portion for actuating said suction device,

(d) a metal plate on said counter portion adjacent said suction opening, and

(e) a trash bin disposed beneath said counter portion,

(f) wherein the top side of said attached board is forwardly inclined relative to said workbench front side

(g) wherein the top side surface of said attached board has a depression for accommodating the handle of a work tool.

4,387,942

DRAWER SLIDE ASSEMBLY

Robert F. Lense, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

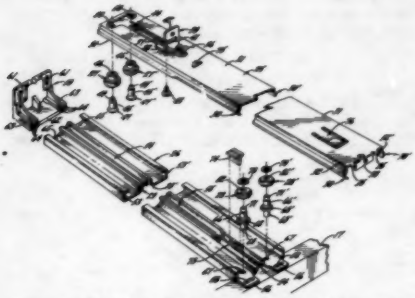
Filed Nov. 28, 1980, Ser. No. 211,089

Int. Cl.³ A47B *88/10*; F16C *21/00*

U.S. Cl. 312—334 9 Claims

1. In a slide assembly for a drawer sliding in a frame, the combination of, first and second elongated parallel members spaced apart and opposing each other and adapted to extend lengthwise of a panel of the drawer, one of said members adapted to be attached to said panel and the other of said members adapted to be attached to said frame, and a roller journaled on said first member to turn about an axis perpendicular to said panel and disposed between said members, said

second member having a track portion extending substantially throughout the length of said second member and projecting toward said first member for engagement with said roller, said track portion being inclined relative to the axis of said roller at a first acute angle, the peripheral surface of said roller opposing said track portion being generally frusto-conical and at a second acute angle relative to the axis of the roller, said second



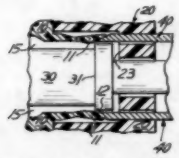
acute angle being slightly smaller than said first acute angle whereby said surface of said roller rolls on said track portion and the force between the surface and the track portion is generally perpendicular to the surface and whereby said track portion engages said surface of said roller at substantially a succession of points forming a circle around the surface and said force acts substantially along a line through said points.

4,387,943

ELECTRICAL CONNECTOR HAVING FRONT OR REAR RELEASABLE AND REMOVABLE CONTACTS

Dee A. Werth, Nineveh; Alan L. Schildkraut, Sidney, and David W. MacAvoy, Bainbridge, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 30, 1981, Ser. No. 279,143
Int. Cl.³ H01R 13/42
U.S. Cl. 339—59 R **3 Claims**



1. In combination with an electrical connector having front and rear releasable and rear removable contacts, said connector of the type having: a housing; a plurality of contacts, each contact having a rear portion, a forward mating portion, and an enlarged middle portion having a forwardly facing shoulder and a rearwardly facing shoulder; and means for releasably mounting said contacts in said housing including a rear insert having a plurality of bores each having the rear portion of a respective contact therein, a plurality of resiliently and radially deflectable members extending from the forward portion of each of said bores, and a forward insert having a plurality of bores each having a portion of the forward portion of a respective contact therein, and a rearwardly facing surface adapted to engage the forwardly facing shoulder of each of said contacts, the improvement wherein:

each of said members of said rear insert, includes at the forward end of said member a radially inwardly chamfered surface and, rearwardly adjacent to the chamfered surface, a forwardly facing shoulder engaging the rearwardly facing shoulder of a respective contact; and

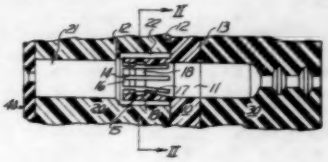
said forward insert includes a plurality of passages annularly arranged around each of said bores, each of its passages axially aligned with a respective forwardly facing shoulder of the deflectable members of said rear insert, whereby a tool may be inserted into the passages to engage and radially deflect said deflectable members at the end of that passage thereby releasing the contact for removal from the rear of the connector.

4,387,944

ELECTRICAL CONNECTOR INSERT

David L. Frear, Afton, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 30, 1981, Ser. No. 279,149
Int. Cl.³ H01R 13/42
U.S. Cl. 339—59 R **4 Claims**



1. In combination with an electrical connector insert of the type having a body of insulation material having a plurality of passages therethrough from a front face to a rear face and respective electrical contact members therein which are insertable from the rear and which have an enlarged portion defining a rearwardly facing shoulder and a forwardly facing shoulder, the improvement comprising:

a plurality of tubular contact retention towers integral with the body and coaxial with the respective passages therein, each of said towers having an internal annular groove therein that includes a forwardly facing wall and an opposing rearwardly facing wall, the surfaces on opposite sides of said groove tapered radially outwardly, each tower being resiliently radially expandable to permit the enlarged section of a respective contact member to pass into the tower upon insertion of the contact member into a respective passage from the rear of the body, said tower contracting when the enlarged portion of the contact members enters the annular groove, the forwardly and rearwardly facing walls of the groove engaging the forward and rearward shoulders of the enlarged portion of the contact member to limit forward and rearward movement of the contact member in the passage, said tapered surfaces on both sides of said groove adapted to receive an appropriate tool from the rear or the front of said passage to radially expand the towers and disengage the enlarged portion of the contact from the groove, whereby the contact may be released from either the front or rear of the passage for removal from the body.

4,387,945

ELECTRICAL CONNECTOR INSERT

David W. MacAvoy, Bainbridge, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

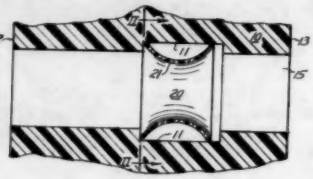
Filed Jun. 30, 1981, Ser. No. 279,275
Int. Cl.³ H01R 13/42
U.S. Cl. 339—59 R **2 Claims**

1. In combination with an electrical connector having removable contacts, said connector of the type having: a housing; a plurality of contacts, each contact having a rear portion, a forward mating portion, and a middle portion; and means for releasably mounting said contacts in said housing, the improve-

ment wherein the means for releasably mounting said contacts includes:

an annular groove in the middle portion of each of said contacts;

an insert having a plurality of bores each having a respective contact therein said insert including an annular groove in each of said bores; and



an annular member mounted in each of said grooves in said insert bore, each of said members extending radially inwardly and having an annular arcuate surface extending around the groove in a respective bore and axially of said passage, said member resiliently and radially deflectable and adapted to snap into the groove in a respective contact whereby, when a contact is inserted into said passage said annular member snaps into the groove in said contact to retain said contact in said insert.

4,387,946

MULTIPIN COUPLER

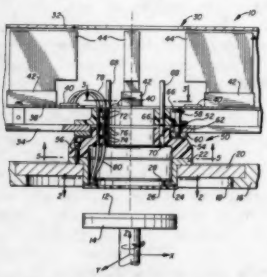
Alfred F. Lauriello, Plano, and Steven D. Swendrowski, The Colony, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US80/01726, § 371 Date Dec. 24, 1980, § 102(e) Date Dec. 24, 1980, PCT Pub. No. W082/02286, PCT Pub. Date Jul. 8, 1982

PCT Filed Dec. 24, 1980, Ser. No. 273,843

Int. Cl.³ H01R *13/631, 13/631*

U.S. Cl. 339—66 M **3 Claims**



1. A multipin coupler for releasably connecting test circuitry to an IC chip probe card, comprising:

an upper ring member having a central opening therethrough;

a lower ring member having a central opening therethrough;

a plurality of pin connections with opposite mating portions mounted in said ring members around the openings therein;

means for aligning said ring members before engagement of said pin connections;

means for adjustably supporting said upper ring member for limited movement relative to said lower ring member; and

a plurality of leads of substantially equivalent lengths interconnecting the test circuitry and probe card through said pin connections;

wherein said supporting means comprises:

a plate with an opening therein aligned with the openings in said ring members;

at least a portion of the test circuitry being supported on said plate;

a plurality of pins secured to said plate; and

a pair of spaced apart stops secured to each pin on opposite sides of said upper ring member to allow axial movement thereof relative to the lower ring member.

4,387,947

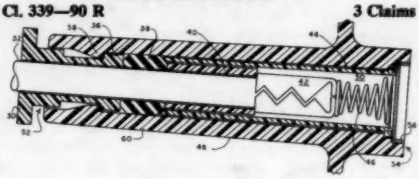
HIGH VOLTAGE CONNECTOR

Arthur J. Lostumo, Franklin Park, and Steven J. Pulchinski, Northbrook, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jun. 29, 1981, Ser. No. 278,160

Int. Cl.³ H01R *13/625*

U.S. Cl. 339—90 R **3 Claims**



1. A disconnect plug for coupling a high voltage conductor to a high voltage receptacle having a bore for receiving the plug and a high voltage contact therein, comprising:

a lock nut having a central aperture for receiving the conductor and a mechanism for locking the nut to the high voltage receptacle;

a deformable annular ring adapted to slip over the conductor in a position adjacent the lock nut;

a generally cylindrical, hollow sleeve adapted to slide over the conductor for pressing the ring against the lock nut;

an electrical contact on an end of the conductor which extends through the sleeve;

an electrically conductive spring carried within the sleeve for engaging the conductor's contact such that, when the plug is inserted into the bore in the high voltage receptacle, the spring engages the high voltage contact therein and is compressed between the latter contact and the conductor's contact, and when the lock nut is locked to the high voltage receptacle, the sleeve deforms the ring into a tight fit with an inner surface of the bore.

4,387,948

SPARK PLUG WIRE TERMINAL AND METHOD FOR ATTACHING TERMINAL

Arthur D. Johnson, Muskego, Wis., assignor to Wells Manufacturing Corporation, Fond du Lac, Wis.

Filed Mar. 3, 1981, Ser. No. 240,133

Int. Cl.³ H01R *11/20*

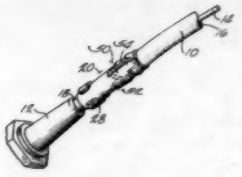
U.S. Cl. 339—97 R **5 Claims**

1. A combination comprising

a spark plug wire having a central electrically conductive core and a layer of insulative material surrounding said core, said spark plug wire having a free end, and

an electrically conductive connector member adapted to be fixedly connected to said free end of said spark plug wire, said connector member including opposite ends, one of said ends including means for releasably clampingly engaging a spark plug and the other of said ends comprising a body adapted to house said free end of said spark plug wire, said body including a pair of spaced apart apertures, and means for securing said other end of said connector

member to said free end of said spark plug wire, said means for securing including a metal staple having a pair of legs and a transverse member joining said legs, said legs being adapted to extend through said apertures and through a central portion of said spark plug wire, and said body being generally cylindrical and including a web portion, and a pair of legs extending from said web portion



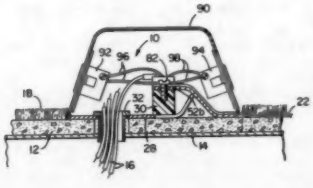
and adapted to surround said wire, said pair of legs of said body including ends which are spaced apart and define a gap therebetween, said gap being elongated and being generally parallel to said longitudinal axis of the wire, and wherein said legs of said metal staple can extend through said gap when said staple is forced through the spark plug wire.

4,387,949

TRANSITION CONNECTION APPARATUS HAVING GROUNDING FEATURE

Louis F. Haitmanek, Florham Park, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Mar. 12, 1981, Ser. No. 243,042
Int. Cl.³ H01R *9/24*
U.S. Cl. 339—125 R **22 Claims**



1. A transition connection apparatus for making electrical interconnection between electrical conductors, comprising:

an insulative member having a plurality of mounting surfaces for joining a plurality of conductors thereon, such mounting surfaces being electrically insulated from each other;

a conductive base member supporting said insulative member;

a conductive plate member secured to said base member and having a portion adjacent to and in registry with one of said mounting surfaces; and

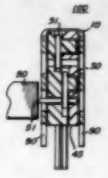
means for fastening a conductor and said plate member portion to said one of said mounting surfaces.

4,387,950

SOCKET ASSEMBLY FOR ACCOMMODATING HORIZONTAL INSERTED COMPONENTS

Andrzej T. Guzik, Ft. Lauderdale, and Lynn T. Gill, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 10, 1981, Ser. No. 233,224
Int. Cl.³ H01R *13/11, 23/02, 25/02*
U.S. Cl. 339—136 M **6 Claims**



1. An improved connector socket assembly for accommodating a plurality of keyed, vertically stacked components which may be horizontally inserted from either side of the socket assembly, including in combination:

a plastic housing of interfitting connector halves wherein one of said housing halves includes at least one cavity in the interior thereof and further wherein a plurality of laterally extending boss members are arranged in first and second horizontal rows in a desired keyed arrangement;

said plastic housing further having first and second rows of apertures located to receive leads of said components extending through both housing halves and which are aligned and associated with each said boss members;

a plurality of performed wire contacts each positioned about a respective boss member and having parallel portions extending across an associated aperture, each of said wire contents having a further portion extending beyond the bottom edge of said housing member; and

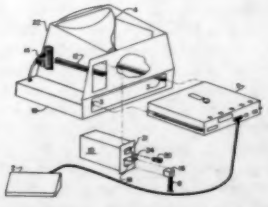
a U-shaped resilent bracket for slidably overfitting said plastic housing for the securing of said housing halves together, said bracket having apertures on respective sides thereof coinciding with said housing apertures.

4,387,951

CATHODE RAY TUBE DISPLAY TERMINAL WITH A REMOVABLE POWER SUPPLY

Roger L. Hall, Nashua, N.H., and Walter J. Conroy, Acton, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jun. 29, 1981, Ser. No. 278,244
Int. Cl.³ H01R *13/00*
U.S. Cl. 339—193 R **3 Claims**



1. A cathode ray tube display terminal includes a power supply mounted to a chassis of said terminal by means of a slide, said power supply including connector fingers for engaging a fixed connector when said power supply is fully inserted into said fixed connector, said power supply being coupled to

a power source through an electrical plug, said power supply comprising:

a molded plate having a plurality of openings;

a handle pivotally mounted to said molded plate within a first opening; and

an electrical receptacle accessible through said first opening for receiving said electrical plug for applying electrical power to said power supply, thereby trapping said handle between said molded plate and said electrical plug;

said handle being freed to pivot when said electrical plug is removed from said electrical receptacle for removing said electrical power from said power supply,

said handle being accessible for unplugging said power supply from said terminal.

4,387,952

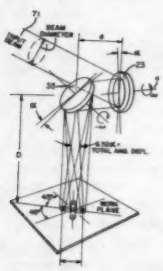
SINGLE AXIS BEAM SCANNER

Robert B. Slusher, San Jose, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Mar. 27, 1981, Ser. No. 248,105

Int. Cl.³ G02B 27/17; B23K 26/00

U.S. Cl. 350—6.9 15 Claims



1. A method of scanning a high power laser beam onto a metal workpiece surface to distribute power substantially uniformly over a selected area of the workpiece surface for metallurgically heat treating the selected area of the surface, said method comprising:

directing an input high power laser beam at a first mirror at an average angle beta to its surface, the first mirror rotating about an axis passing centrally through the mirror's surface, the mirror being tilted such that a perpendicular to the surface is at an angle alpha from the axis of rotation;

positioning a second mirror in the path of the reflected beam from the first mirror, such that the beam from the first mirror strikes the second mirror at the same average angle beta to its surface, while rotating the second mirror in the opposite direction and at the same angular speed as the first about an axis passing centrally through the second mirror's surface, the second mirror being tilted such that a perpendicular to its surface is at approximately the same angle alpha from its axis of rotation;

selecting the mirror positions and adjusting the phase of the two rotating mirrors such that the resulting beam scan reciprocates substantially in a straight line on the metal workpiece surface, and

effecting a metallurgical change in the selected area of the workpiece surface scanned by the beam through the heating produced by the high power scanned beam.

4,387,953

OPTICAL WAVEGUIDE DEVICE WITH PHASE MATCHING LAYERS

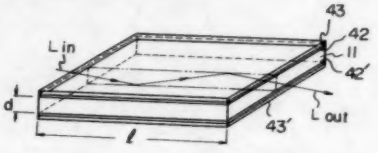
Masataka Shirasaki, Kawasaki, and Takeshi Obokata, Sagamihara, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 30, 1981, Ser. No. 249,014

Claims priority, application Japan, Mar. 28, 1980, 55-40776; May 7, 1980, 55-60129; Aug. 30, 1980, 55-120192; Aug. 30, 1980, 55-120193

Int. Cl.³ G02B 5/172

U.S. Cl. 350—96.14 21 Claims



1. An optical waveguide device, comprising:

an optical waveguide member having a predetermined length and thickness, the thickness being far smaller than the length, said optical waveguide device operating so that light to be processed is illuminated onto an input surface of the optical waveguide member, the light issuing from an output surface, and the light travelling from the input surface to the output surface with a plurality of reflections from top and bottom surfaces of said optical waveguide member; and

phase-matching layers mounted on each of the top and bottom surfaces of the optical waveguide member, the phase-matching layers functioning to substantially decrease the difference between a first phase shift of a first polarized component of the light and a second phase shift (δ_2) of a second polarized component of the light each phase shift being created every time each of said reflections takes place.

4,387,954

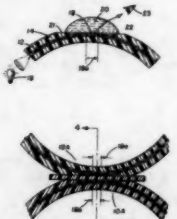
METHOD FOR FABRICATING AN OPTICAL WAVEGUIDE EVANESCENT WAVE COUPLER HAVING AN INTERLEAVED FILM

J. Donald Beasley, Arlington Heights, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 19, 1981, Ser. No. 225,893

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.15 1 Claim



1. A method for fabricating an optical waveguide evanescent wave coupler, from optical waveguides of the type having a core concentrically surrounded by a cladding material, said method comprising the steps of:

a. transmitting optical energy through the core of a first optical waveguide thus illuminating the core;

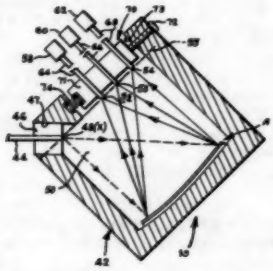
b. removing a portion of the cladding from said first optical waveguide;
c. detecting when there is an increase in scattered light from the illuminated core of said first optical waveguide;
d. stopping the removal of the cladding material when said increase in scattered light is detected;
e. performing the steps of transmitting, removing, detecting and stopping for a second optical waveguide;
f. placing said first and said second optical waveguides with the removed cladding surfaces in juxtaposition with an interleaf of material between said first and said second optical waveguides such that evanescent wave coupling occurs.

4,387,955

HOLOGRAPHIC REFLECTIVE GRATING MULTIPLEXER/DEMULTIPLEXER

Jacques E. Ludman, Westford; Joseph L. Horner, Cambridge, and Thomas L. Mikes, Harvard, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 3, 1981, Ser. No. 231,074
Int. Cl.³ G02B 5/32
U.S. Cl. 350—96.19 **8 Claims**



1. A multiplexer/demultiplexer comprising:
a holographically formed, spherically curved reflective grating, said holographically formed grating being configured to diffract only one first order beam;
means located substantially at a first preselected point adjacent said holographically formed reflective grating for directing into or receiving from said holographically formed reflective grating a single beam of electromagnetic radiation having a plurality of different wavelengths; and
means located at a plurality of positions substantially along a line extending through said first preselected point and a second preselected point adjacent said holographically formed reflective grating for receiving from or directing into said holographically formed reflective grating a plurality of beams of electromagnetic radiation, each of said beams being at a different wavelength.

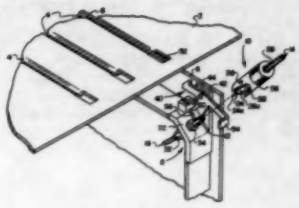
4,387,956

FIBER OPTIC INTERLOCK

Charles D. Cline, Dallas, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 9, 1981, Ser. No. 271,909
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 **10 Claims**

1. A retaining device for preventing removal of a fiber optic connector module from a card cage when a fiber optic cable and mating connector is attached to said module, comprising:
a release lever pivotally mounted to said module and having a hook portion engaging said card cage upon insertion of said module into said card cage to prevent withdrawal of said module, said lever being manually pivotable to a release position to disengage said hook portion from said card cage to permit removal of said module, said lever having an interference stop portion which strikes said mating connector of said fiber optic cable when the latter is attached to said module, to prevent pivoting of said



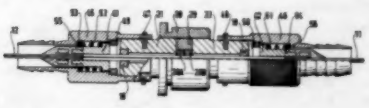
lever to said release position and hence prevent disengagement of said hook portion from said card cage, whereby to prevent removal of said module.

4,387,957

CONNECTOR FOR OPTICAL FIBRES

Georges Mignien, Meyzieu, France, assignor to Societe Anonyme dite: Compagnie Lyonnaise de Transmissions Optiques, Clichy, France

Filed Nov. 10, 1980, Ser. No. 205,546
Claims priority, application France, Nov. 8, 1979, 79 27543
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 **4 Claims**



1. A connector for optical fibres, said connector including two groups of three cylindrical support rods all of the same diameter and guide means to keep said two groups of three rods side by side and in contact with each other so as to provide a central passage to house the optical fibres, said passage being delimited by the adjacent side surfaces of the three rods, the improvement wherein said guide means includes a group of at least three bearings which are held coaxially including two end bearings, at least one of said three bearings being sized to and surrounding the two groups of three rods on either side of their plane of contact with very little play and forming a central bearing, said end bearings surrounding each group of three rods with the same or a slightly greater play, said bearings being fitted in housings in a coaxial sleeve, the central bearing being in the plane of symmetry of the sleeve and the end bearings being located at the ends of the sleeve, and wherein said coaxial sleeve consists of two symmetrical end portions having outer ends of each end portion forming a housing for a respective end bearing, and an intermediate sleeve component whose inside bore diameter is larger than that of the bores of the end portions, said intermediate component housing said central bearings.

4,387,958

LONGITUDINALLY WATER-TIGHT CABLES AND METHOD OF PRODUCING THE SAME

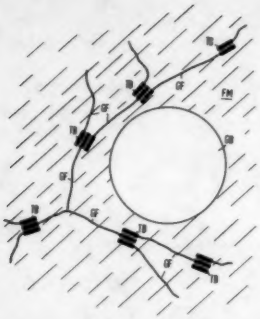
Guenter Zeidler, Germering; Gerhard Lange, and Helmut Saller, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 261,786, May 8, 1981, abandoned. This application May 18, 1982, Ser. No. 379,368

Claims priority, application Fed. Rep. of Germany, May 12, 1980, 3018141; Dec. 19, 1980, 3048074

Int. Cl.³ B32B *27/00*; G02B *5/16*; H02G *15/20*

U.S. Cl. 350—96.23 9 Claims



1. In a longitudinally water-tight communication cable structure having at least one signal-carrying element therein and a jacket for sealing the interior of such structure off from the outside and having in the interior thereof a filling material containing a water-repellant substance and relatively small-diameter gas bubbles embedded in such filling material, the improvement comprising:

wherein said filling material is comprised of a rubber-like network formed from a polyolefin powder;

said polyolefin powder having a crystalline melting point lower than the processing temperature of the remaining constituents of said filling material;

said polyolefin powder having an average grain size in the range of about 20 to 600 μm; said polyolefin powder having a density in the range of about 0.915 to 0.96 g/ml; and

said polyolefin powder being present in said filling material in an amount in the range of about 5 to 30 weight percent, based on the total weight of said filling material; and

wherein said gas bubbles have an average diameter in the range of about 1 to 1500μ, said gas bubbles being maintained in their respective spatial positions within said filler material by said rubber-like network.

4,387,959

REAR PROJECTION SCREEN

Howard G. Lange, Prospect Heights, and Ronald Schulman, Northfield, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 6, 1981, Ser. No. 222,836

Int. Cl.³ G03B *21/60*

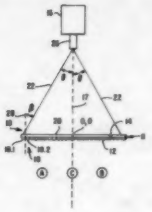
U.S. Cl. 350—128 9 Claims

1. A projection screen for use with projection means located rearwardly of said screen for displaying an image to a plurality of observers located at viewing positions which are on the front side of said screen and dispersed in a direction parallel to said screen;

said projection means defining an axis;

said screen including at least one array of substantially rectilinear lenticules having respective light-refracting cross-sectional shapes adapted to redirect light arriving from the rear side of said screen so that an image formed on said screen by said light is visible at said dispersed positions;

said respective cross-sectional shapes of said lenticules varying as a function of their distance from said axis in such manner that, for each said position within a selected angular viewing range, a greater fraction of the incident image light is directed to that viewing position from those lenticules which are further from said axis than is directed to that viewing position from those lenticules which are



closer to said axis, so as to at least partially compensate for the image light rearward reflection loss gradient;

said lenticule cross-sectional shapes being defined by a succession of lenticule profile elements;

the slope angle, length and position of each of said lenticule profile elements being determined by an algorithm which calculates the light transmission provided by each of said lenticule profile elements, and adjusts said slope angles, lengths and positions thereof to achieve said reflection loss gradient compensation.

4,387,960

MULTI-LAYER ANTI-REFLECTION COATING

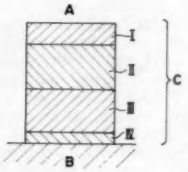
Hakuzo Tani, Sakai, Japan, assignor to Minolta Camera Co. Ltd., Sakai, Japan

Filed Mar. 17, 1981, Ser. No. 244,342

Claims priority, application Japan, Mar. 31, 1980, 55-42629

Int. Cl.³ G02B *1/10*

U.S. Cl. 350—164 24 Claims



1. A multi-layered anti-reflection coating for use with a glass substrate to reduce reflectance of light comprising four layers, the first layer furthest from the substrate having a refractive index, N_1 and an optical thickness N_1d_1, the second layer having a refractive index N_2 and an optical thickness N_2d_2, the third layer having a refractive index N_3 and an optical thickness N_3d_3 and the fourth layer closest to the substrate having a refractive index N_4 and an optical thickness N_4d_4, wherein the refractive indices and the optical thicknesses are related as follows with respect to a preselected design wavelength, λ_o:

$N_1d_1 \cong 0.25\ \lambda_o$;

$N_2d_2 \cong 0.50\ \lambda_o$;

$0.50\ \lambda_o \leqq N_3d_3 \leqq 0.75\ \lambda_o$;

$N_4d_4 < 0.25\ \lambda_o$;

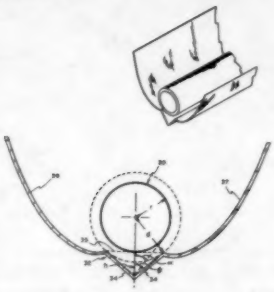
$1.35 \leqq N_1 \leqq 1.62$;

$1.90 \leqq N_2 \leqq 2.30$;

$1.90 \leqq N_4 \leqq 2.30$;

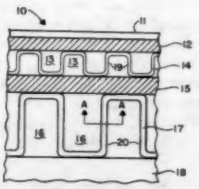
$1.56 \leqq N_3 \leqq 1.80$; and
$N_1 < N_3$

4,387,961
COMPOUND PARABOLIC CONCENTRATOR WITH CAVITY FOR TUBULAR ABSORBERS
Roland Winston, 5217C S. University Ave., Chicago, Ill. 60615
Continuation of Ser. No. 113,169, Jan. 18, 1980, abandoned. This application Jan. 30, 1981, Ser. No. 230,137
Int. Cl.³ G02B 5/10; F24J 3/02
U.S. Cl. 350—296 **4 Claims**



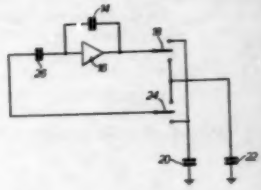
1. In combination with a tubular energy receiver, a Compound Parabolic Concentrator trough having an opening adapted to be oriented toward a source of radiant energy, said trough provided with reflective concave sidewalls, a portion of each of which is shaped to assume the maximum possible slope consistent with reflecting maximum angle energy rays onto said energy receiver, each of said sidewalls terminating and joined to a reflective trough-shaped cavity, said cavity comprising: a pair of substantially planar walls joined at an apex and arranged in a V-shape wherein the mouth of said V forms an aperture; said tubular energy receiver being placed no further from said apex than tangent to said aperture.

4,387,962
CORROSION RESISTANT LASER MIRROR HEAT EXCHANGER
John G. Gowan, London, England, and Roy A. Hamil, Tijeras, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Oct. 6, 1981, Ser. No. 308,976
Int. Cl.³ G02B 7/18
U.S. Cl. 350—310 **4 Claims**



1. An improved laser mirror comprising:
a. a mirrored surface;
b. a faceplate supporting said mirrored surface;
c. a heat exchanger, adjacent said faceplate, having internal wall surfaces defining a plurality of passageways for passage therethrough of fluid coolant for cooling said faceplate;
d. means for protecting said wall surfaces from the corrosive effect of said coolant, said means including a thin, substantially uniform metallic coating deposited on said wall surfaces.

4,387,963
TEMPERATURE COMPENSATION FOR A LIQUID CRYSTAL DISPLAY VIA CAPACITANCE COMPENSATION OF THE LIQUID CRYSTAL MATERIAL
Martin J. Brennan, Blackpool, England, assignor to Racal Research Limited, Bracknell, England
Filed Oct. 14, 1980, Ser. No. 196,917
Claims priority, application United Kingdom, Nov. 17, 1979, 7939824
Int. Cl.³ G02F 1/13
U.S. Cl. 350—331 T **3 Claims**



1. An electrical circuit arrangement responsive to a transducer whose capacitance varies with a particular ambient parameter and also with applied voltage, comprising
a high input impedance amplifier,
means connecting the transducer to produce negative feedback across the amplifier,
two output capacitors,
an input capacitor having a predetermined capacitance and connected to the input of the amplifier, and
switch means arranged to connect each of the output capacitors alternately to the output of the amplifier and to connect the other of them to the input of the amplifier through the input capacitor,
whereby the circuit arrangement is stable when the charge on each of the output capacitors is such that the voltage across the transducer controls it to have a capacitance equal to that of the input capacitor so that the gain of the amplifier and the transducer is unity, and any changes in the capacitance of the transducer caused by variations in the said parameter produce a change in voltage across the transducer in a sense and by an amount so as to produce a substantially equal and opposite change in its capacitance whereby the said voltage is a measure of the parameter.

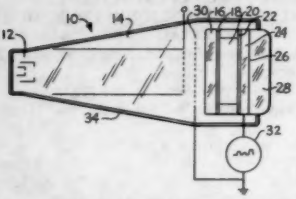
4,387,964
ELECTRON ADDRESSED LIQUID CRYSTAL LIGHT VALVE
Ignacio M. Arrazola, Kirkwood; Raymond E. Brown, Florissant, and Homer E. Dillard, Bridgeton, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Oct. 21, 1980, Ser. No. 199,292
Int. Cl.³ G02F 1/13
U.S. Cl. 350—331 R **10 Claims**

1. A light valve comprising:
means for producing a focused scanning electron beam;
a liquid crystal cell comprising:
a liquid crystal disposed between two parallel alignment surfaces, the alignment of one such surface being rotated relative to the other such surface,
a thin optical flat having one surface as one of said alignment sufaces and the other surface as a dielectric mirror such that the dielectric mirror faces the electron beam producing means;

a thin film of insulating material serving as the second alignment surface

a transparent electrode disposed adjacent to the thin film of insulating material, and

a faceplate disposed adjacent the transparent electrode;



an effectively electron-transparent electrode comprising a fine conducting mesh disposed parallel to and spaced from about one to about 50 microns from the dielectric mirror; and

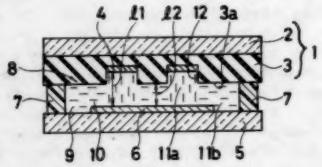
circuit means to apply a video signal between the transparent electrode and the electron transparent electrode in synchronization with the electron beam producing means.

4,387,965

GUEST HOST TYPE, POSITIVE AND NEGATIVE RECESSED LIQUID CRYSTAL DISPLAY DEVICES

Yoshiyuki Hara, Kishiwada, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 6, 1981, Ser. No. 222,920
Int. Cl.³ G02F 1/13
U.S. Cl. 350—349 6 Claims



1. A liquid crystal display device comprising:

first and second substrates having opposed inward facing surfaces;

first electrode means formed on the inward facing surface of said first substrate;

a plurality of second electrode means formed on the inward facing surface of said second substrate, thereby forming electrode-less areas on said second substrate;

said substrates being spaced apart with a first distance between said first and second electrode means being greater than a second distance between said electrode-less areas on said second substrate and said first electrode means;

a pleochroic guest dye material contained between said substrates, said dye material having a maximum absorption spectrum in the direction of its longitudinal axis; and

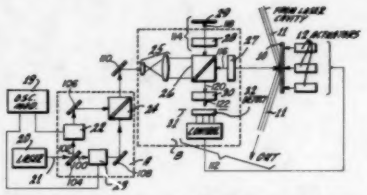
means for activating selected ones of said second electrode means whereby the area defined by said activated second electrode means forms a desired display.

4,387,966

WIDE BANDWIDTH OPTICAL MODAL DEFORMATION SENSOR

Sandor Holly, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 9, 1980, Ser. No. 167,265
Int. Cl.³ G02F 1/29
U.S. Cl. 350—360 2 Claims



1. A wide bandwidth optical modal deformation sensor, comprises:

a deformable mirror for reflecting a laser beam;

a plurality of actuators incorporated in said deformable mirror and designed to control surface deformation;

a detector point electronically connected to each actuator;

means for directly measuring the optical path difference at each of said detector points, comprising:

a measuring laser beam capable of being split into two orthogonally polarized components;

a polarization cube for splitting said measuring laser beam;

means for generating a frequency difference between said orthogonally polarized components;

means for recombining said two orthogonally polarized components into a composite beam having two orthogonally polarized components differing by said frequency difference;

means for directing said composite beam to a polarization interferometer;

means for expanding and polarization splitting said composite beam into a test beam and a reference beam;

means for conveying said test beam to said deformable mirror;

means for conveying said reference beam to a highly planar reference mirror;

means for returning and recombining said test and reference beams to form a two-component resultant beam;

means for extracting components of polarization which are polarized in the same direction from said two-component resultant beam such that said extracted components of parallel polarization are caused to interfere with each other and generate a dynamic interference pattern, fringes of which move at the rate of the frequency difference of said test and said reference beam;

an intercepting plane having a plurality of said detector points located therein for detecting interference pattern and generating an output signal;

an electronic phase detector for measuring phase or optical path difference between each of said detector points and its respective reference point;

means for generating a signal proportional to the optical path difference at each of said detector points; and

arithmatic circuits for converting optical path difference signals to modal representations of wave front aberrations and generating output signals indicating the presence and strength of said aberrations; and

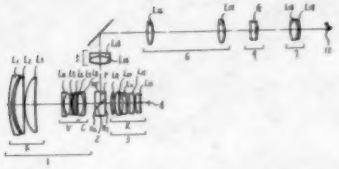
means for energizing said actuators by conveying said output signals indicating the presence and strength of said aberrations from said arithmatic circuits to said actuators.

4,387,967

OPTICAL SYSTEM FOR USE IN SINGLE LENS REFLEX CAMERAS

Yasuo Yamazaki, Kawachinagano; Kazuo Kimura, and Tetsuyuki Tanimoto, both of Sakai, all of Japan, assignors to Minolta Camera Co., Ltd., Sakai, Japan

Filed Mar. 26, 1980, Ser. No. 134,218
Claims priority, application Japan, Mar. 27, 1979, 54-36553
Int. Cl.³ G02B 15/00
U.S. Cl. 350—423 19 Claims



1. An optical system for use in single lens reflex cameras comprising:

an objective lens system consisting of an object side part with its longitudinal chromatic aberration of F-line to d-line being overcorrected to provide a negative value in diopters, and an image side part of a positive refractive power with its longitudinal chromatic aberration of F-line to d-line being undercorrected to provide a negative value in millimeters, an image forming light path being passed through the object side and image side parts toward the image, whereby the undercorrected longitudinal chromatic aberration of the image side part is substantially cancelled with the overcorrected longitudinal chromatic aberration of the object side part;

means for branching the image forming light path between the object side part and the image side part of the objective lens system; and

a branch optical system of a positive refractive power with its longitudinal chromatic aberration of F-line to d-line left in an undercorrected condition, to provide a positive value in diopters, the branch optical system receiving the branched light path to form a finder system in combination with the object side part of the objective lens system, whereby the undercorrected longitudinal chromatic aberration of the branch optical system is predetermined in a complimentary manner to be substantially cancelled by the overcorrected longitudinal chromatic aberration of the object side part of the objective lens system.

4,387,968

ZOOM LENS MOUNT BARREL

Tetsuo Sekiguchi, Kumagaya, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,681
Claims priority, application Japan, Oct. 22, 1979, 54/146051[U]
Int. Cl.³ G02B 7/10
U.S. Cl. 350—429 6 Claims

1. A zoom lens mount barrel, comprising:

a zooming operational sleeve (4);

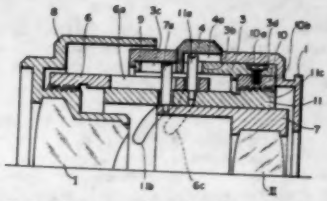
a support sleeve (11) having inner and outer peripheries and having a rear lens group moving cam slot (11*b*) formed therein;

a fixed connecting sleeve (3, 10) threadingly engaging said support sleeve;

a rear lens support frame (7) slidable with respect to said inner periphery of said support sleeve;

a front lens support frame (6) slidable with respect to said outer periphery of said support sleeve and having a front lens group moving cam slot (6c) formed therein;

a first pin (7*a*) at a fixed circumferential position and secured to said rear lens support frame, said first pin engaging said rear lens group moving cam slot; and



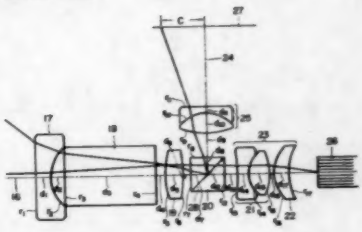
a second pin (11*a*) rotatable with said zooming operational sleeve around the circumferential direction of said zoom lens mount barrel, said second pin engaging said front lens group moving cam slot.

4,387,969

SINGLE-LENS REFLEX OPTICAL SYSTEM FOR ENDOSCOPES

Kimihiko Nishioka, and Nobuo Yamasita, both of Hachiouji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1981, Ser. No. 222,874
Claims priority, application Japan, Jan. 7, 1980, 55-429
Int. Cl.³ G02B 5/17
U.S. Cl. 350—462 4 Claims



1. A single-lens reflex optical system for endoscopes comprising an observing optical system, a light-splitting means and a photographing optical system, said observing optical system comprising a diverging front lens group arranged on a first optical axis extending in parallel with the longitudinal direction of an endoscope and having negative refractive power, a positive lens group arranged on said first optical axis, a first converging rear lens group arranged on said first optical axis and having positive refractive power, and a first aperture stop arranged between said positive lens group and said first converging rear lens group and on said first optical axis, said light-splitting means being arranged between said positive lens group and said first converging rear lens group, said photographing optical system comprising said diverging front lens group, said positive lens group, a second converging rear lens group arranged on a second optical axis split by said light-splitting means and having positive refractive power, and a second aperture stop arranged between said positive lens group and said second converging rear lens group, said optical system satisfying the following conditions:

$$\frac{1}{f_1} \leq \frac{1}{\frac{1}{\frac{1}{f_2} - \frac{1}{f_2}} + A - t_2} - \frac{1}{f} \quad \text{(I)}$$

$$f_2 \leq A - t_2 - f_1 \quad \text{(II)}$$

-continued

$$\frac{k}{F\tan\omega}\left(1+\frac{A-t_2}{-f_1}\right)\leqq 1 \qquad \text{(III)}$$

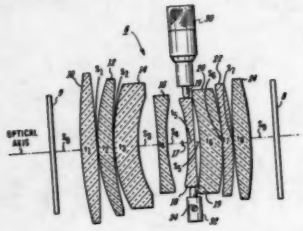
wherein reference symbol f represents the focal length of the photographing optical system, reference symbol f_1 represents the focal length of the diverging front lens group, reference symbol f_2 represents the focal length of the positive lens group, reference symbol A represents the distance between the diverging front lens group and the second aperture stop, reference symbol t_2 represents the distance between the positive lens group and the second aperture stop, reference symbol F represents the F-number of the photographing optical system, reference symbol ω represents a half field angle of the photographing optical system, and reference symbol k represents the ratio between the height of marginal ray in the photographing optical system at the front of the light-splitting means and the height of marginal ray in the observing optical system at the front of the light-splitting means.

4,387,970

PROJECTION LENS ASSEMBLY

Harry P. Brueggemann, San Marino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1980, Ser. No. 133,220
Int. Cl.³ G02B *7/02, 9/64*
U.S. Cl. 350—463 **6 Claims**



1. A projection lens assembly along an optical axis from front to rear comprising a double convex element, a first positive meniscus element convex to the front, a negative meniscus element convex to the front, a double concave element, a plano-concave element, a second positive meniscus element concave to the front, a third positive meniscus element concave to the front, and a double convex element.

4,387,971

DYNAMIC DAMPING SYSTEM

Charles F. Grove, Costa Mesa, and David A. Rodriguez, Capistrano Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

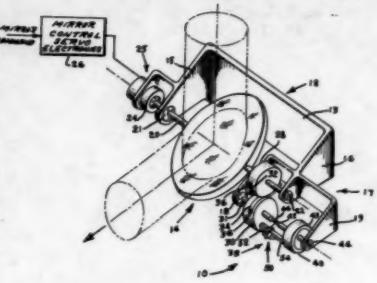
Filed Sep. 30, 1980, Ser. No. 192,406
Int. Cl.³ G02B *23/00*
U.S. Cl. 350—500 **10 Claims**

1. A dynamic damping system for stabilizing the motion of an object with respect to inertial space, comprising:

means for supporting said object for rotation about an axis;

means operably attached to said object for rotating said object in either of two directions about said axis to a predetermined position; and

means operably attached to said object for substantially maintaining said object in said predetermined position, wherein said means for substantially maintaining said object in said predetermined position includes a rotatable inertia balancer, said inertia balancer being supported by a first rod positioned within said object support means, said first rod lying along an axis parallel to said object axis, means operably attached to said object for interconnecting said object to said inertia balancer, a rotatable damper mass, said damper mass being supported by a second rod positioned within said object support means, said second



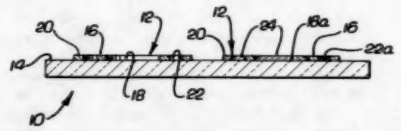
rod lying along said inertia balancer axis, means interconnecting said first rod and said second rod for permitting said damper mass to aid in substantially eliminating undesirable movement of said object thereby maintaining said object in said predetermined position.

4,387,972

MICROSCOPE SLIDE WITH CONFIRMING WELLS

Donald W. Valencia, El Dorado Hills, Calif., assignor to Immuno Concepts, Inc., Sacramento, Calif.

Filed Feb. 26, 1981, Ser. No. 238,472
Int. Cl.³ G02B *21/34*
U.S. Cl. 350—536 **9 Claims**



1. A microscope slide for use in diagnostic procedures of liquid specimens, said slide comprising a substantially flat base layer and a substantially flat overlay layer adhered thereto and having on one surface at least one structurally defined area for retaining liquid specimens during preparation for subsequent microscopic analysis, said area having a first boundary forming a well with a flat bottom defined by a surface of the base layer, and a second boundary forming a channel outside said first boundary, each of said boundaries being formed by the edges of openings through said overlay layer, whereby fluid spilled from said well during specimen preparation is retained in said channel.

4,387,973

APPARATUS FOR MAINTAINING CLEAN OPTICAL SURFACES IN PROCESS ENVIRONMENTS

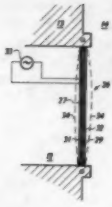
John R. Martin, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Apr. 30, 1981, Ser. No. 258,983
Int. Cl.³ G02B *7/18*
U.S. Cl. 350—582 **6 Claims**

1. A self-cleaning optical device, suitable for use in a dirty environment, comprising:

a multi-layered composite optical surface including

a sheet of semi-rigid piezoelectric backing material,
a thin, flexible, light-interactive first metallized electrode deposited on one side of said piezoelectric backing material,
a second metallized electrode deposited on the opposite side of said piezoelectric backing material, and
a protective layer of transparent plastic film disposed on the outer surface of said light-interactive first metallized



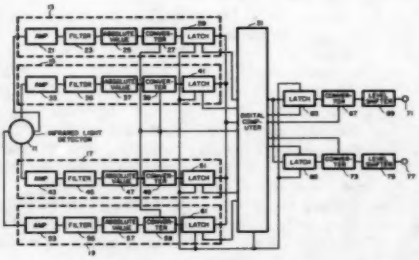
electrode, said plastic film being resistant to adhesion of particles thereto;
means for supporting said composite optical surface to permit vibratory movement thereof; and
a source of electrical energy of varying intensity connected across said first and second metallized electrodes, for inducing vibratory movement of said optical surface, whereby particles deposited on said plastic film are removed.

4,387,974

CIRCUIT FOR CALCULATING THE POSITION OF THE EYE

Albert H. Marshall, and Gary M. Bond, both of Orlando, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 11, 1981, Ser. No. 262,152
Int. Cl.³ A61B *3/14*
U.S. Cl. 351—210 **13 Claims**



1. A circuit for calculating the position of the cornea of a human eye comprising in combination:
detecting means having a field of view and a quartet of outputs for sensing a pulsed infrared light reflected from the cornea of said human eye and for providing a quartet of square wave signals indicative of the X coordinate position and the Y coordinate position of the cornea of said human eye within the field of view of said detecting means;
a quartet of filtering means, each of which has an input connected to one of the outputs of said detecting means and an output, and each of which is adapted for removing from one of said quartet of square wave signals any extraneous noise so as to provide at the output thereof a sinusoidal waveform signal;
a quartet of absolute value circuit means, each of which has an input connected to the output of one of said quartet of filtering means and an output, and each of which is adapted for rectifying one of said sinusoidal waveform signals so as to provide at the output thereof a full wave rectified signal;
a quartet of analog-to-digital converting means, each of which has a data input connected to the output of one of said quartet of absolute value circuit means, and an output, and each of which is adapted for producing digital signals in response to one of said full wave rectified signals;
a quartet of latching means, each of which has a data input connected to the output of one of said analog-to-digital converting means, a select input, and an output, and each of which is adapted for storing therein the digital signals produced by one of said analog-to-digital converting means;
computing means having a data input effectively connected to the outputs of said quartet of latching means, first, second, third and fourth select outputs respectively connected to the select inputs of said quartet of latching means, a fifth select output, a sixth select output, and a data output for providing first, second, third and fourth select signals for effecting the transfer of the digital signals stored within said latching means from said latching means to the data input of said computing means, for calculating, in accordance with an eye position measurement program, the X and Y coordinate positions of the cornea of said human eye within the field of view of said detecting means, for providing at the data output thereof digital signals indicative of the X coordinate position of the cornea of said human eye within the field of view of said detecting means and for providing at the data output thereof digital signals indicative of the Y coordinate position of the cornea of said human eye within the field of view of said detecting means; and
a pair of digital-to-analog converting means, each digital-to-analog converting means of which has an input connected to the data output of said computing means and an output, the first digital-to-analog converting means of which is adapted for producing analog signals in response to said digital signals indicative of the X coordinate positions of the cornea of said human eye within the field of view of said detecting means, and the second digital-to-analog converting means of which is adapted for producing analog signals in response to said digital signals indicative of the Y coordinate positions of the cornea of said human eye within the field of view of said detecting means.

4,387,975

AUTOMATIC FOCUSING POSITION DETECTION APPARATUS

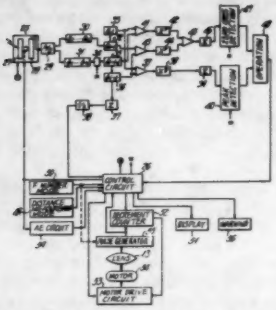
Kunihiko Araki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Oct. 28, 1980, Ser. No. 201,528
Claims priority, application Japan, Oct. 31, 1979, 54-141107; Nov. 26, 1979, 54-152731; Nov. 26, 1979, 54-152732; Dec. 3, 1979, 54-156657
Int. Cl.³ G03B *3/00*; G01J *1/44*
U.S. Cl. 354—25 **8 Claims**

1. An automatic focusing position detection apparatus including a plurality of photoelectric element groups, each photoelectric element group capable of separately detecting light from an object, which is capable of detecting the focusing position by the output of said plurality of photoelectric element groups, comprising:
shift means for shifting the output signals from a first photoelectric element group of said photoelectric element groups relative to the output signals of a second photoelectric element group of said photoelectric element groups; and
defocusing distance calculation means for calculating a defocusing distance from the correlation degree between the output signals of said first photoelectric element group and the output signals of said second photoelectric element group, which are relatively shifted to each other by

said shift means, and from the relative shift distance of said two photoelectric element groups,

wherein said defocusing distance calculation means comprises an integration device for multiplying the difference



between the outputs of each pair of photoelectric elements of said first photoelectric element group and said second photoelectric element group which are relatively shifted to each other and integrating said difference.

4,387,976

LIGHT QUANTITY INDICATING CIRCUIT FOR AN ELECTRONIC FLASH DEVICE

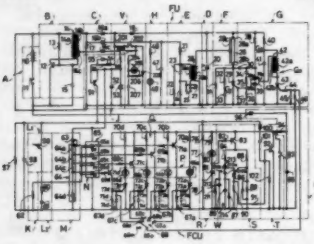
Yoshiyuki Takematsu, 38-1 Komaba 1 Chome, Meguro-ku, Tokyo, Japan

Filed Jun. 24, 1981, Ser. No. 276,818

Claims priority, application Japan, Jun. 25, 1980, 55-086264

Int. Cl.³ G03B *7/16, 15/03*

U.S. Cl. 354—33 **18 Claims**



1. A light quantity indicating circuit for an electronic flash unit comprising means for boosting the voltage of a direct current power source and for storing electric energy, flash light generating means including a flash tube energized by said electric energy for generating a flash of light, trigger signal generating means for triggering said flash tube, flash stopping means for stopping the flash of said flash light generating means when the quantity of said flash of light attains a predetermined value, a first light receiving means for receiving reflected light which is produced from said flash tube and reflected from an object to be photographed, said receiving means generating a signal in response to the quantity of the received light, said stopping means being operative to terminate the energy supplied to said flash tube when said quantity reaches a predetermined level, gate means responsive to light emissions from said flash tube for enabling said first light receiving means during the flashing of said flash tube, detecting means for detecting the quantity of the light from said flash tube by comparing the voltage of an electric signal obtained by integrating said signal with a reference voltage, indicating means responsive to said detecting means for indicating a light quantity, and a second light receiving means for actuating said gate means in response to receiving light from a light source other than said flash tube whereby said first light receiving means activates such that said indicating means indicates the light quantity in the presence of other light sources.

4,387,977

POWER SUPPLY DEVICE FOR CAMERA

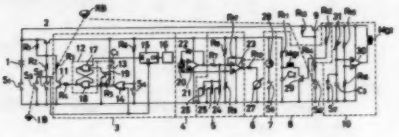
Masanori Uchidoi, Yokohama; Hiroshi Aizawa, Kawasaki; Kazunobu Urushihara, Yokohama; Nobuyuki Suzuki, and Masami Shimizu, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1979, Ser. No. 85,230

Claims priority, application Japan, Oct. 23, 1978, 53-130828

Int. Cl.³ G03B *7/26*

U.S. Cl. 354—60 R **4 Claims**



1. A camera, comprising:

(a) a movable release member;

(b) a first switch for actuation in response to a first movement of the release member from its rest position;

(c) shutter means actuated in response to a second movement of the release member;

(d) a first circuit including at least a photographic information forming circuit for producing a photographic information signal and an indicator for indicating photographic information on the basis of the photographic information signal;

(e) power applying means for applying power from a power source to said first circuit when the first switch is actuated;

(f) a timer circuit connected to said power applying means to perform a time counting operation in response to the operation of said first switch;

(g) a holding circuit for holding said power applying means operative independent of the state of the first switch in response to an output of the timer circuit and for causing said power applying means to continue to supply the power to the first circuit during a period of time defined by said timer circuit even after the release member has returned to the rest position thereof;

(h) illuminating means for illuminating said indicator from said power applying means when said power applying means is operative; and

(i) selecting means for selecting an operation of said illuminating means so that said illuminating means becomes operative only when said selecting means selects the operation of the illuminating means.

4,387,978

FOLDING CAMERA WITH PIVOTALLY MOUNTED VIEWFINDER

Donato F. Pizzuti, Lynnfield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1981, Ser. No. 334,981

Int. Cl.³ G03B *13/02, 17/04*

U.S. Cl. 354—187 **8 Claims**

1. A folding camera including a self-erecting and folding viewfinder, said camera comprising:

a base housing section including means for supporting a film unit at a film plane within said base section;

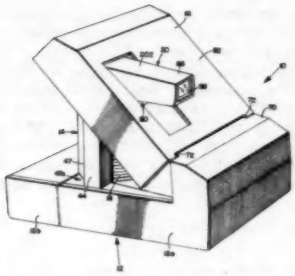
a lens housing section mounting an objective lens and including means configured to be engaged by a viewfinder for locating the viewfinder in a predetermined operative

orientation with respect to said objective lens, said lens housing section being pivotally coupled to said base section, adjacent one end thereof, for movement between an upstanding operative erected position and a folded storage position wherein it is folded back over said base housing section in overlying relation to at least a portion of said film plane;

a mirror assembly including a mirror pivotally coupled to said base section, adjacent an opposite end thereof, for movement between an operative erected position for reflecting image-forming light rays from said lens onto said film plane to expose a film unit thereat and a folded storage position overlying at least a portion of said film plane;

a foldable bellows coupled to said base and lens housing sections and said mirror assembly for movement between an erected position for light shielding the exposure optical path extending between said objective lens, mirror and film plane, and a flat storage position wherein at least a portion of said bellows overlies said film plane;

a cover housing section pivotally coupled to said base section adjacent said opposite end thereof for movement between an erected position providing clearance for said lens housing section, mirror assembly and bellows to assume their respective erected positions and a folded storage position overlying said base section and protec-



tively covering said folded lens housing section, mirror assembly and bellows;

first erecting means interconnecting said lens and cover housing sections for coordinated movement between their respective erected and storage positions;

second erecting means interconnecting said lens housing section and said mirror assembly for coordinated movement between their respective erected and storage positions;

a viewfinder pivotally mounted on said cover section for movement between an operative erected position wherein at least a portion of said viewfinder engages said locating means on said lens housing section to locate said viewfinder in said predetermined orientation for viewing and framing a scene in the field of view of said objective lens and a folded storage position wherein at least a portion of said viewfinder overlies a portion of said lens housing section located in its said storage position; and

third erecting means, including said locating means, responsive to movement of said cover section from its said storage position to its said erected position for effecting movement of said viewfinder from its said storage position to its said erected position and also responsive to movement of said cover section from its said erected position to its said storage position for effecting movement of said viewfinder from its said erected position to its said storage position.

4,387,979

COPYING OPTICAL SYSTEM

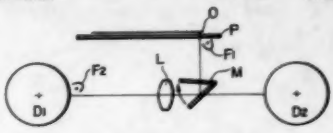
Michiro Ohishi, Hatoyama; Ryota Ogawa, Kawagoe, and Yasunori Arai, Asaka, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1981, Ser. No. 242,737

Claims priority, application Japan, Mar. 24, 1980, 55-37289

Int. Cl.³ G03G 15/00, 15/30

U.S. Cl. 355—3 R **8 Claims**



1. A copying machine in which an original image is formed as a visible image on a first drum, said visible image is used as a secondary original image which is focused on a second drum and is transferred from said second drum to a recording sheet to thereby provide copies, a copying optical system characterized in that a single projecting lens is used commonly in a first optical path through which said original image is projected onto said first drum and in a second optical path through which said secondary original image is projected onto said second drum.

4,387,980

CHARGING DEVICE FOR ELECTRONIC COPIER

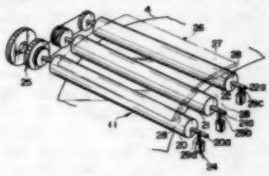
Tsuyoshi Ueno, Fujisawa; Hideo Mukai, Yokohama; Yoshitsugu Nakatomi, Yokohama; Hiroshi Saito, Yokohama; Koichi Kinoshita, Narashino, and Takaaki Konuma, Shizuoka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 19, 1980, Ser. No. 218,444

Claims priority, application Japan, Dec. 25, 1979, 54-168535; Jan. 23, 1980, 55-6658[U]; Jan. 24, 1980, 55-7349; Jan. 24, 1980, 55-7350; Jan. 24, 1980, 55-7493[U]; Jan. 24, 1980, 55-7494[U]

Int. Cl.³ G03G 15/00, 15/16

U.S. Cl. 355—3 CH **14 Claims**



1. An electronic copier comprising:

a light-sensitive medium,

charging means including a plurality of contact charging elements in contact with said light-sensitive medium for charging said medium;

voltage supply means for supplying different voltages to said contact charging elements, the voltages applied to said contact charging elements being made successively higher in accordance with the order of arrangement of the contact charging elements in the direction of movement of said light-sensitive medium;

exposure means for forming an electrostatic latent image on said light-sensitive medium;

means for developing said electrostatic latent image to form a visible image on said light sensitive medium;

means for transferring said visible image formed on said light-sensitive medium onto a recording sheet;

means for fixing the visible image transferred onto said recording sheet, and

means for cleaning said light-sensitive medium.

4,387,981

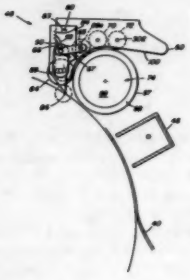
SHEET STRIPPING APPARATUS AND METHOD

Raymond G. Cormier, Nashua, N.H., assignor to Nashua Corporation, Nashua, N.H.

Filed Dec. 23, 1980, Ser. No. 219,511

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 SH **19 Claims**



1. In a photocopying apparatus having

a movable member having a photosensitive surface,

means for forming a developed latent image on said photosensitive surface,

means for feeding a copy sheet material for contact with said photosensitive surface at a transfer station for transferring said developed image onto said copy sheet material, and

means for removing said copy sheet from said photosensitive surface,

the improvement wherein said sheet removing means comprises

a sheet stripping element having an operative portion resiliently biased against said photosensitive surface for contacting a leading edge of said copy sheet as it moves toward said sheet stripping element for detaching said leading edge of said copy sheet from said photosensitive surface,

a moving roller member deflection surface positioned adjacent said operative portion of said sheet stripping element and moving in a direction, at a closest approach position to the photosensitive surface, opposite to the direction of movement of the photosensitive surface, for substantially immediately deflecting said detached leading edge away from said sheet stripping element and toward an exit path, said moving surface thereby maintaining said copy sheet out of contact with said sheet stripping element,

means for driving said moving surface for deflecting said copy sheet material toward said exit path and away from said photosensitive surface,

a driven roller member is driving contact with said roller member surface, and

a resilient element for biasing the sheet stripping element operative portion toward and in engagement with said photosensitive surface.

4,387,982

CHARGED PARTICLE CONTAINMENT APPARATUS

Michael R. Stanley, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1981, Ser. No. 279,415

Int. Cl.³ G03G *15/08*

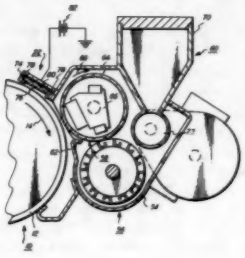
U.S. Cl. 355—3 DD **26 Claims**

1. An apparatus for developing an image voltage region recorded on a photoconductive member having a non-image voltage region and an image voltage region thereon, including:

a housing defining a chamber for storing charged particles therein;

means, positioned interiorly of the chamber of said housing, for transporting the charged particles from the chamber of said housing to the photoconductive member so as to deposit charged particles onto the image voltage region to form a particle image;

means, positioned exteriorly of the chamber of said housing, for holding charged particles scattered from the chamber of said housing; and



means for electrically biasing said holding means to a voltage level having a magnitude intermediate the magnitude of the image voltage level and the magnitude of the non-image voltage level so as to form an electrical field between the non-image voltage region and said holding means which attracts charged particles of one polarity to said holding means and an electrical field between the image voltage region and said holding means which repels the charged particles from said holding means to the image voltage region of the photoconductive member.

4,387,983

SCAN TYPE IMAGE RECORDING APPARATUS

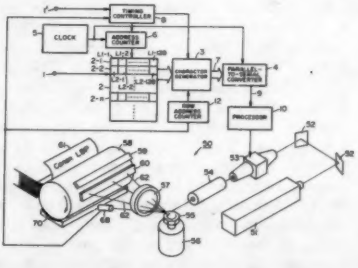
Koichi Masegi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1980, Ser. No. 165,139

Claims priority, application Japan, Jul. 3, 1979, 54/84180; Jun. 19, 1980, 54/83066

Int. Cl.³ G03G *15/28*; G01D *15/14*

U.S. Cl. 355—8 **15 Claims**



15. A scanning type image recording apparatus comprising:

means for producing a recording signal variable between a first level and a second level;

means for forming from said recording signal a modulation signal variable between one level and a different level corresponding to said first level and said second level of said recording signal such that the width of said modulation signal at said one level is enlarged from the width of

said recording signal at said first level by a predetermined width;

beam forming means responsive to said modulation signal to emit a beam of light;

beam deflecting means for deflecting the beam of light emitted from said beam forming means;

photosensitive means positioned to be irradiated by the beam of light deflected by said beam deflecting means, to form a latent image thereon in accordance with the beam irradiation; and

developing means for developing the latent image on said photosensitive means to be visualized.

4,387,984

HANDY COPYING SYSTEM

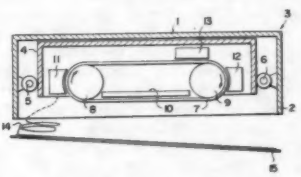
Masamichi Sato, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 1, 1982, Ser. No. 344,725

Claims priority, application Japan, Feb. 6, 1981, 56-16703; Feb. 6, 1981, 56-16704; Feb. 6, 1981, 56-16705; Feb. 6, 1981, 56-16707

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—12 **18 Claims**



1. A portable electrophotographic copying system for transferring an image of an original to a transfer medium comprising,

a contact reflection exposure type electrophotographic photosensitive member which is enclosed in an outer casing and is movable between an outer position in which it is adapted to be brought into contact with the original and an inner position in which it is inwardly retracted from the outer position,

charging means for charging an exposure surface of the electrophotographic photosensitive member,

exposing means for projecting light onto the electrophotographic photosensitive member from the side thereof remote from the original when the electrophotographic photosensitive member is in said outer position, thereby forming an electrostatic latent image on said exposure surface of the electrophotographic photosensitive member by exposing the surface to the imagewise light reflected from the original,

developing means for developing the electrostatic latent image with toners to form a toner image, and

light shielding means for preventing the electrophotographic photosensitive member from being exposed to external light while the photosensitive member is charged and exposed to the light from the exposing means and while the electrostatic latent image is developed, said charging means, exposing means and developing means all being enclosed in said outer housing.

4,387,985

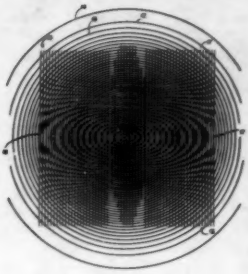
UNIQUE COPYBOARD HAVING UNIQUE LIGHT ATTENUATOR

Irving J. Magin, and Erik K. Nelson, both of Fairport, N.Y., assignors to Itek Corporation, Lexington, Mass.

Filed Oct. 5, 1981, Ser. No. 308,329

Int. Cl.³ G03B *27/72*

U.S. Cl. 355—71 **7 Claims**



1. In a process camera having a bank of fluorescent lamps for illuminating a subject to be photographed, including a flat light diffuser plate positioned over said bank of lamps:

a transparent cover plate positionable over said light diffuser plate to maintain said subject to be photographed flat against the upper surface of said light diffuser plate;

a lens system for projecting images of said subject upon a photosensitive surface; the improvement comprising:

a flat light attenuator positioned between said bank of fluorescent lamps and said light diffusion plate, said attenuator having a large plurality of light attenuating, constant density, circular lines thereon, concentric with a central point upon said attenuator, the spacing between said circular lines continuously increasing along radial paths emanating from said central point.

5. In a process camera having support means for supporting a subject to be photographed together with subject illuminating means for illuminating said subject and a lens system for projecting images of said subject upon a photosensitive medium, the improvement comprising:

a light attenuator positioned between said subject illumination means and said subject, said attenuator having a plurality of light attenuating, constant density, circular lines, concentric with a central point upon said attenuator, the spacing between said circular lines continuously increasing along radial paths emanating from said central point, said light attenuator further including a plurality of constant density, light attenuating straight lines overlaying a major portion of said attenuator, and wherein said subject illumination means comprises elongated light emitting elements having longitudinal axes, said straight lines being oriented parallel to said longitudinal axes of said elongated light emitting elements.

4,387,986

MANUSCRIPT FEED DEVICE FOR AN ELECTROPHOTOGRAPHIC APPARATUS

Hiroshi Tsuda, Mitaka; Kiyoshi Miyashita; Masaji Nishikawa, both of Hachioji; Akira Shimizu, Fuchu, and Muneo Kasuga, Hachioji, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 29,461, Apr. 12, 1979, abandoned. This application Oct. 1, 1980, Ser. No. 192,925

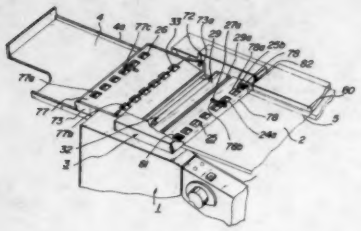
Claims priority, application Japan, Apr. 18, 1978, 53-46184

Int. Cl.³ G03B *27/62*

U.S. Cl. 355—75 **3 Claims**

1. In a manuscript feed device for an electrophotographic

apparatus comprising an elongated manuscript tray for defining a sheet manuscript feed path, upper and lower side feed mechanisms arranged at a front end of said manuscript tray above and below said manuscript feed path with said sheet manuscript feed path interposed therebetween, said upper side feed mechanism being disposed so as to be aligned with said lower side feed mechanism thereby constituting a thick manuscript feed path together with the manuscript tray, a sheet manuscript driving means, and a thick manuscript driving means for feeding a thick manuscript carriage and located at



the outside of the maximum width position of the sheet manuscript, the improvement comprising a sheet manuscript guide means which is movably connected at one edge of said manuscript tray to prevent the sheet manuscript from passing over said thick manuscript driving means when feeding the sheet manuscript, and a thick manuscript guide means arranged at an outer position relative to the sheet manuscript guide means viewed along the width of the manuscript, the thick manuscript guide means being exposed when said sheet manuscript guide means is moved so as to guide the thick manuscript carriage along the manuscript tray.

4,387,987

METHOD OF PRODUCING SOLID-STATE COLOR IMAGING DEVICES

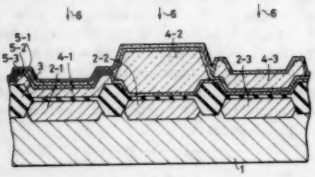
Norio Koike, Tokyo; Akira Sasano, Hinodemachi; Yoshio Taniguchi, Hino; Toshio Nakano, Hinodemachi; Masakazu Aoki, Kodaira, and Iwao Takemoto, Hindoemachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1981, Ser. No. 266,191

Claims priority, application Japan, May 26, 1980, 55-68968

Int. Cl.³ G03B *27/32, 27/02*

U.S. Cl. 355—133 **11 Claims**



1. A method of producing a color solid-state imager comprising the steps of integrating in the shape of a matrix on an identical semiconductor substrate a number of picture elements, each consisting of a photoelectric conversion element and a scanning element for addressing the photoelectric conversion element, and forming, by photoetching a film of material of which color filters are made, mosaic color filters stacked on the picture elements, characterized in that the color filters are formed by the use of at least one photoetching mask having filter patterns arrayed in the shape of a matrix for manufacturing said color filters, said filter patterns having dimensions that are reduced relative to dimensions of the picture elements.

4,387,988

AUTOMATIC DISTANCE MEASURING DEVICE

Motonobu Matsuda, Kawachinagano, and Yoshihiro Tanaka, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

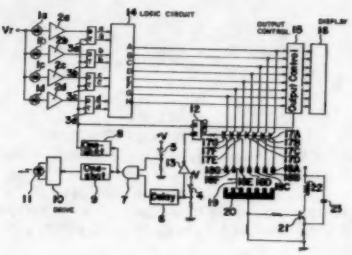
Continuation of Ser. No. 65,747, Aug. 10, 1979, Pat. No. 4,303,335. This application Jul. 23, 1981, Ser. No. 285,878

Claims priority, application Japan, Aug. 21, 1978, 53/102180

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.³ G01C *3/10, 3/05*

U.S. Cl. 356—1 **11 Claims**



1. A distance measuring device which comprises:

means for directing a beam of light towards a target object;

means for receiving the beam of light reflected by the target object, said receiving means having a plurality of at least three light sensing portions, the optical axes of which intersect the path of travel of said beam of light in different ranges of distance from said directing means;

means responsive to said receiving means for signaling whether conditions of the respective light sensing portions are light sensing or non-light sensing;

means for determining a target object distance in response to said signaling means;

first means responsive to said signaling means for detecting when the light sensing portions, the optical axes of which intersect the path of travel of the beam of light in non-neighboring ranges of distance, are in the light receiving condition; and

means connected to said first means for producing an output in response to the detection by said first detecting means for indicating that the distance measurement is in an abnormal condition.

4,387,989

COHERENT OPTICAL FEATURE IDENTIFIER APPARATUS

Andrew R. Pirich, Marcy, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 23, 1980, Ser. No. 171,614

Int. Cl.³ G06K *9/58, 9/76*

U.S. Cl. 356—71 **8 Claims**

1. An optical correlator for identifying features on a photographic film comprising in combination:

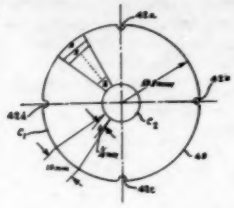
means for generating a source of coherent light, said coherent light being non-divergent,

means for focusing said coherent light through said photographic film, said photographic film including an index of refraction matching means attached to said photographic film,

a spatial filter disk in alignment with and interacting with said focusing means, said spatial filter disk comprises a

glass disk with a plurality of wedge sections inscribed thereon, each wedge section of said plurality of wedge sections being divided into a plurality of linearly decreasing sub-regions, each sub-region having a discrete emulsion deposition that is characteristic of a particular feature,

a Fourier Transform lens between said means for focusing coherent light and said spatial filter disk, said spatial filter disk having a Fourier Transform power spectra emulsion



deposited thereon, said spatial filter disk providing an optical correlation signal in response to the coincidence of a photographic film feature and a corresponding filter disk Fourier Transform power spectra feature, and,

means for detecting said optical correlation signal positioned in alignment with said spatial filter disk, said detecting means providing an analog signal in response to said optical correlation signal.

4,387,990

CHEMICAL ANALYSIS SLIDE FRAME ASSEMBLY

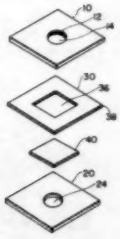
Kenichiro Yazawa; Masao Kitajima, and Asaji Kondo, all of Asaka, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Mar. 26, 1981, Ser. No. 247,677

Claims priority, application Japan, Mar. 28, 1980, 55/41787[U]

Int. Cl.³ G01N *21/01, 21/27*

U.S. Cl. 356—244 **31 Claims**



1. A chemical analysis slide frame assembly comprising: first and second slide frames each of which has an opening whose area is smaller than the area of a chemical analysis film which said frame assembly is adapted to receive; and a third slide frame disposed between said first and second slide frames, said third slide frame having an opening adapted to receive said chemical analysis film and said third slide frame being shaped so as to substantially prevent the displacement of said chemical analysis film, said third slide frame having a thickness which is equal to or larger than the thickness of said chemical analysis film, and a side wall of the opening in said first slide frame having a small optical reflection factor.

4,387,991

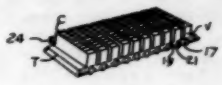
AUTOMATIC MONOCHROMATIC LIGHT ABSORBANCE MEASUREMENT ANALYZER

Saul R. Gilford, Oberlin; Robert J. Emary, Wakeman, and Glen A. Carey, North Ridgeville, all of Ohio, assignors to Gilford Instrument Laboratories, Inc., Oberlin, Ohio

Continuation-in-part of Ser. No. 929,987, Aug. 1, 1978, Pat. No. 4,236,825. This application Oct. 14, 1980, Ser. No. 196,995

Int. Cl.³ G01N *1/10*

U.S. Cl. 356—246 **3 Claims**



1. A cuvette for carrying a fluid sample for use in apparatus for analyzing said sample and wherein said apparatus has conveying means movable along a testing path and connector means on said conveying means for moving said cuvette along said path; said cuvette comprising: a vessel of generally rectangular parallelepiped configuration; a plurality of separate chambers in said vessel, each adapted to hold a separate fluid sample under test, each chamber being open at its top to permit the placement of a fluid sample therein and each said chamber being provided with a window to permit monochromatic light to pass undistorted optically therethrough and into said chamber; and coupling means on one end of said vessel engageable with said connection means to enable said vessel to be movable to a plurality of positions along said path as defined by each of said chambers.

4,387,992

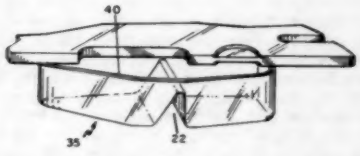
ROTATABLE CUVETTE ARRAY

Peter J. Swartz, 33 Pine Ave., Randolph, Mass. 02368

Filed May 22, 1981, Ser. No. 266,137

Int. Cl.³ G01N *21/07*

U.S. Cl. 356—246 **4 Claims**



1. An improved cuvette array comprising:

a. means defining a rigid planar member component thereof with upper and lower faces and a center of rotation having defined therein analyzer readable indicator means in a circular array about said center of rotation and further having defined therein substantially along radial lines with reference to said center of rotation a plurality of substantially radially elongated reagent/sample access apertures arrayed in a circular fashion with their long axes defined on said radii of the planar member and further having, concentric and outward of the reagent/sample access apertures, a plurality of first analyzer-readable windows defined in said planar member, each associated with one of said reagent/sample access apertures and located respectively on the same radii of said reagent/sample access apertures' axes;

b. means defining as further components of the cuvette array a plurality of boat members, each having elongated opposing side walls, an outer end wall and an inner end wall joined to said side walls, all said walls having upper rims joined in a fluid-tight fashion to said planar disk, and a base having

integrally formed therein an in said adjoining side walls a divider of ramp form defining with said walls and base a reagent chamber on a radially inner side thereof and a sample chamber on the radially outer side thereof, each boat member located beneath a reagent/sample access aperture having its reagent chamber directly below said reagent/sample access aperture and its sample chamber accessible through said reagent/sample aperture and below said first clear optical window, each of said boats having a a clear section in its base below its respective optical window;

c. the said planar member and boat components being constructed and arranged for weldability at the upper walls of the rim of each boat to the planar member; and

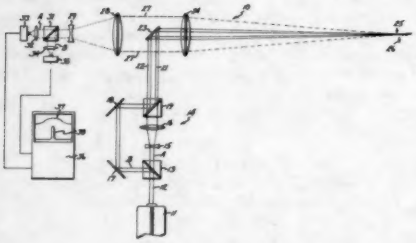
d. the thickness of each of the planar members to boat walls being in ratio between 1:2 to 2:1 and each of the planar members and walls being within 0.020 to 0.070 inch average thickness.

4,387,993

PARTICLE SIZE MEASURING METHOD AND APPARATUS

Ronald J. Adrian, Champaign, Ill., assignor to TSI Incorporated, St. Paul, Minn.

Filed Jun. 25, 1981, Ser. No. 277,150
Int. Cl.³ G01N *15/02*
U.S. Cl. 356—336 **26 Claims**



1. An apparatus for measuring particle size of particles moving with a fluid comprising: a laser unit operable to generate a collimated light beam, first means for separating the light beam into a plurality of separate different light beams and arranging the light beams in relative colinear relationship, said first means including means to expand one of said light beams to provide an expanded first light beam, and a second light beam, and means to colinearly arrange the expanded first light beam with said second light beam, lens means to focus the colinearly related first and second light beams in a common focus area having concentrically positioned focused light, said fluid and particles moving through the center of said focus area whereby the particles moving through the focus area scatter light, means to collect and recollimate the scattered light, means for separating the collected scattered light into a plurality of scattered light beams, photodetector means for sensing the separate plurality of scattered light beams and producing electrical signals corresponding to the amount of sensed light, and means for receiving said electrical signals and producing readable information as to the size of the particles moving with the fluid through the focus area.

4,387,994

OPTICAL SYSTEM FOR SURFACE TOPOGRAPHY MEASUREMENT

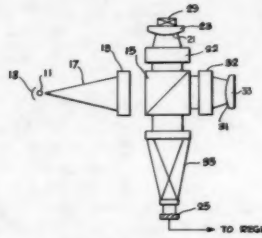
N. Balasubramanian, 20361 Chalet La., Saratoga, Calif. 95070

Continuation-in-part of Ser. No. 117,855, Feb. 4, 1980, Pat. No. 4,340,306. This application Jul. 19, 1982, Ser. No. 399,520
Int. Cl.³ G01B *11/24*
U.S. Cl. 356—360 **3 Claims**

1. A non-contacting method for measuring deviations between a reference wavefront representing a reference surface and a test wavefront representing a test surface comprising,

establishing a white light interference pattern on a detector between two wavefronts, one wavefront from at least one point on a reference surface of known topography and another wavefront from a corresponding point on a test surface of unknown topography,

repeatedly translating one of the wavefronts from said surfaces by known incremental distances relative to the detector from a starting position and establishing other white light interferences patterns, one for each translation, while establishing zero optical path differences between wavefronts from locations on the reference surface and corresponding locations on the test surface of unknown topography,



reading light intensity levels at a number of sample points of the interference pattern for each translation,

calculating a statistical function indicative of the contrast maximum for each of the sample points of the interference pattern over the range of wavefront translation,

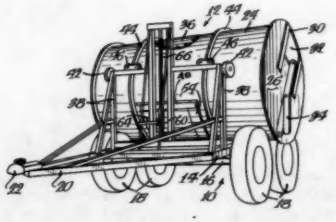
recording the positions of calculated maximum fringe contrast and the corresponding incremental distance of surface translation relative to the starting position for each sample point, whereby the points of maximum fringe contrast at a given step represent points, the locus of which defines contours for which there is zero optical path difference between the test surface and the reference surface.

4,387,995

PORTABLE CONCRETE MIXING AND TRANSPORT APPARATUS

Edwin J. Routson, 135 N. Oakwood, West Chicago, Ill. 60185

Filed May 7, 1981, Ser. No. 261,579
Int. Cl.³ B28C *5/22, 5/42, 7/16*
U.S. Cl. 366—2 **10 Claims**



1. Apparatus for mixing and transporting concrete comprising:

a trailer with a longitudinal axis;

a pair of wheels rotatably mounted on said trailer and supporting said trailer for transport, said pair of wheels having a coincident axis of rotation perpendicular to the longitudinal axis of said trailer;

a rotatable drum for holding concrete and having an axis of

rotation parallel to the axis of rotation of said pair of wheels;

support means mounted on said trailer for receiving and rotatably supporting said drum and for holding said drum in contact with said pair of wheels for rotation by said wheels;

means between said trailer and said drum for raising and lowering said drum out of and into driving engagement with said wheels; and

means for lifting one side of said drum to tilt said drum and discharge the concrete therefrom.

9. A method of transporting and mixing concrete, which comprises:

placing a predetermined amount of dry concrete mix into a cylindrical drum which is mounted on a trailer having four wheels;

towing the trailer to the site where the concrete is to be used with the drum out of engagement with the wheels;

placing a predetermined amount of water into the drum at the site where the concrete is to be used; and then

engaging the drum into rotatable contact with said wheels and

towing the trailer so that the wheels rotate the drum and mix the concrete mix with the water; and then

tilting the drum to one side of the trailer to discharge desired quantity of mixed concrete.

4,387,996

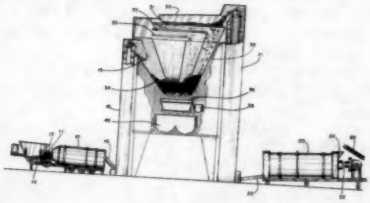
BATCH METHOD OF RECYCLING ASPHALTIC CONCRETE

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 139,640, Apr. 14, 1980, Pat. No. 4,326,809, and a continuation-in-part of Ser. No. 180,297, Aug. 22, 1980, each is a continuation-in-part of Ser. No. 1,051, Jan. 28, 1979, Pat. No. 4,219,278, which is a continuation-in-part of Ser. No. 871,351, Jan. 23, 1978, Pat. No. 4,208,131, and a continuation-in-part of Ser. No. 906,734, May 17, 1978, Pat. No. 4,240,754. This application May 11, 1981, Ser. No. 262,553

Int. Cl.³ B28C *5/04, 5/20*

U.S. Cl. 366—4 **8 Claims**



1. A batch method of producing an asphalt-aggregate composition at a temperature of at least about 200° F. and having at least 50% used asphaltic concrete comprising:

(a) heating particles of 100% used asphaltic concrete to a temperature of at least about 150° F. in a first drum by directly exposing said particles to hot gases of combustion,

(b) heating virgin aggregate to a temperature of less than about 400° F. in a second drum, and

(c) mixing the heated particles of used asphaltic concrete, virgin aggregate, and liquid asphalt to achieve said asphalt-aggregate composition.

4,387,597

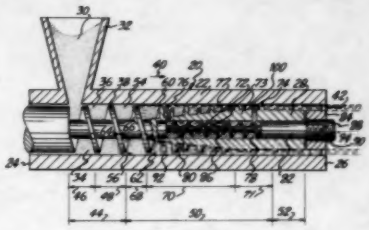
PLASTICATING EXTRUDER SCREW CONVEYORS

Reuben Klein, Edison, and Imrich Klein, Highland Park, both of N.J., assignors to Scientific Process & Research, Inc., Somerset, N.J.

Continuation-in-part of Ser. No. 104,094, Dec. 17, 1979, Pat. No. 4,290,702. This application Sep. 16, 1981, Ser. No. 302,512

Int. Cl.³ B29B *1/10*

U.S. Cl. 366—79 **8 Claims**



1. Apparatus for use in a plasticating extruder of the type having an axially extending elongate barrel for preparing a plasticated material from solids introduced into the extruder, said apparatus comprising:

a first screw conveyor for placement in the barrel, said first screw conveyor including a main flight defining a channel for continuously conveying the material in a downstream direction as the material is melted within the channel, said flight having a leading face facing downstream and a trailing face facing upstream, said channel extending between the leading face and the trailing face;

a backfeed passage within the first screw conveyor, said backfeed passage communicating with the channel at a downstream location and at an upstream location to establish an extended flow circuit along which the material will move through the channel and the backfeed passage, the downstream location being in position to receive at least some unplasticated material from the channel, and the upstream location being spaced axially upstream of the downstream location a distance sufficient to enable plastication within the backfeed passage of at least some of the unplasticated material admitted to the backfeed passage;

a drainage opening interconnecting the channel and the backfeed passage at the downstream location for enabling the flow of unplasticated material into the backfeed passage at the downstream location;

a melt-return aperture interconnecting the backfeed passage and the channel at the upstream location for enabling the flow of plasticated material from the backfeed passage to the channel at the upstream location;

a second screw conveyor located in said backfeed passage and arranged to convey material from the downstream location to the upstream location so as to enable recirculation of material along the extended flow circuit through the backfeed passage; and

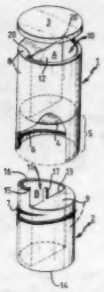
a solids-directing flight on the first screw conveyor extending along the channel between the melt-return aperture and the drainage opening, the axial distance between the solids-directing flight and the main flight being varied along the first screw conveyor for directing unplasticated material into the drainage opening while diverting unplasticated material away from the melt-return aperture for unobstructed return of plasticated material from the backfeed passage to the channel and segregation of at least some of the returned plasticated material from the unplasticated material in the channel such that the segregated already plasticated material will not flow through the extended flow circuit.

4,387,998

DEVICE FOR MIXING AND DISTRIBUTING A TWO-CONSTITUENT PRODUCT

Elemer Szigeti, 1, Place Eugene Mo, Nice (Alpes Maritimes), France

Filed May 20, 1981, Ser. No. 265,511
Claims priority, application France, Dec. 12, 1980, 80 26087
Int. Cl.[3] B01F *13/00*; B65D *25/08*
U.S. Cl. 366—130 5 Claims



1. Mixing and distributing device for a two-constituent product, notably for the formation of a foam in situ, comprising, first and second interfitted compartments each having an inner end and an outer end, the inner ends facing each other and being separated by a web and means for tearing said web under the action of the axial approach movement of said compartments through their inner ends, the walls of the inner ends including complementary threads designed to cooperate to bring about said approach, each of said compartments comprising a solid portion and a hollow portion in the form of a substantially semi-cylindrical trough bounded by a longitudinal surface, the first compartment comprising a removable plug at its outer end and said web at its inner end, said second compartment being closed at its outer end and provided at its inner end with both a peripheral projection forming a cutting-out knife for the web and an axial tit projecting with respect to the inner end of its solid portion.

4,387,999

ELECTRONIC SUNDIAL APPARATUS

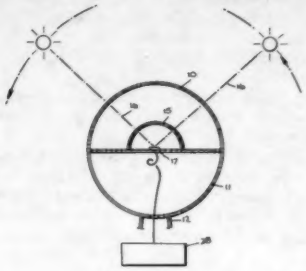
Edwin F. Shelley, 339 Oxford Rd., New Rochelle, N.Y. 10804

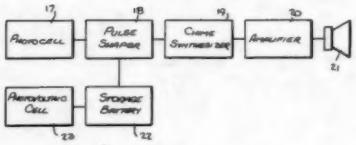
Filed Aug. 25, 1981, Ser. No. 296,161
Int. Cl.[3] G04B *19/26*
U.S. Cl. 368—15 7 Claims

1. An electronic sundial apparatus responsive to changes in the position of the sun in the sky for signaling, on an hourly basis, the passage of time, comprising:

a first hemisphere having an elongated, vertically-disposed aperture and a plurality of elongated generally vertically extending diverging apertures disposed in the surface of said hemisphere at predetermined locations thereon, said diverging apertures being configured so as to diverge at the uppermost ends thereof in opposite directions away from said vertically-disposed aperture, said vertically-disposed and diverging apertures having a predetermined location and a predetermined length and shape corresponding to the azimuths and the distance between the maximum and minimum altitudes of the sun in the sky at each hour throughout the year for a predetermined, selected latitude;

a second hemisphere disposed concentrically within said first hemisphere, said second hemisphere also including an elongated vertically-disposed aperture and a plurality of elongated, generally vertically extending diverging apertures disposed in the surface of said hemisphere at predetermined locations thereon, said diverging apertures being configured so as to diverge at the uppermost ends thereof in opposite directions away from said vertically-disposed aperture, said vertically-disposed and diverging apertures having a predetermined location and a predetermined length and shape corresponding to the azimuths and the distance between the maximum and minimum altitudes of the sun in the sky at each hour throughout the year for a predetermined, selected latitude, said apertures function-





ing in conjunction with said apertures in said first hemisphere to collimate, once each hour, sunlight and cause said collimated sunlight to pass through the concentric radial center of said hemispheres;

detector means, disposed at said concentric center of said hemispheres, for detecting the presence of said sunlight collimated by said hemispheres; and

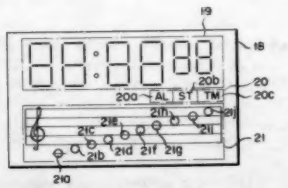
means, coupled to said detector means, for signaling the detection of collimated sunlight by said detector means.

4,388,000

ELECTRONIC APPARATUS HAVING A MUSICAL ALARM FUNCTION AND A DISPLAY

Touru Hagihira, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1980, Ser. No. 202,800
Claims priority, application Japan, Nov. 7, 1979, 54-153675[U]
Int. Cl.[3] G04C *21/00*, *19/00*
U.S. Cl. 368—72 4 Claims



1. An electronic apparatus having a musical alarm function, a function other than said musical alarm function and a display, comprising:

a source of reference clock signals;

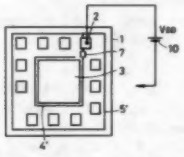
time counting means for counting said reference clock signals to form time data;
means for generating alarm time data;
time display means coupled to said time counting means for displaying said time data;
alarm function circuit means coupled to said time counting means and to said alarm time data generating means, said alarm function circuit means including:
alarm time detection means for determining whether said time data coincides with alarm time data;
note code memory means for storing note codes for a melody;
note code readout means coupled to said note code memory means for sequentially reading out said note codes from said note code memory means when said time data is determined to coincide with said alarm time; and
melody generating means coupled to said note code readout means for generating a melody according to said readout note codes;
a plurality of optical display elements provided on and between lines of the five-line musical staff;
scale display control means coupled to said optical display elements for selectively driving said optical display elements to display the notes of said melody when said melody is generated by said melody generating means; and
function display control means coupled to said optical display elements for selectively driving said optical display elements to produce a display of said function other than said musical alarm function which the apparatus performs when said melody is not generated.

4,388,001

ELECTRONIC TIMEPIECE

Yasuhiko Nishikubo, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 192,714
Claims priority, application Japan, Oct. 9, 1979, 54-139154[U]
Int. Cl.³ G04C *19/00*; B01J *17/00*
U.S. Cl. 368—87 **5 Claims**



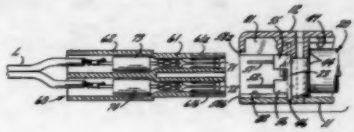
1. A CMOS integrated circuit including a logic circuit for an electric timepiece comprising:
an N-type substrate;
a connecting portion provided on said N-type substrate for connecting a high potential side of a voltage supply to said N-type substrate;
a plurality of N^+ impurity regions of high impurity concentration formed in said N-type substrate;
a first aluminum lead connected to said impurity regions formed in said N-type substrate, and to said connecting portion for decreasing resistance between said voltage supply and said substrate;
a second aluminum lead provided on said N-type substrate for supplying a voltage to said logic circuit; and
a resistor provided between said second aluminum lead and said connecting portion.

4,388,002

CONNECTOR FOR ARRANGEMENT FOR A-C. CLOCK MECHANISM

Anthony W. Rigazio, Oglesby; Donald E. Mathieson, Peru, both of Ill., and Paul E. Hawkinson, Louisville, Miss., assignors to Spartus Corporation, Skokie, Ill.

Filed Dec. 3, 1980, Ser. No. 212,356
Int. Cl.³ G04C *10/00*
U.S. Cl. 368—88 **2 Claims**



1. In a synchronous a-c. clock the combination comprising a housing, the housing being formed of a plastic base plate and plastic cover member of shallow cup shaped mated together about the periphery to form an enclosed space having side walls, a drive coil having a core and bobbin mounted in the enclosed space, a drive train mounted in the enclosed space, a permanently magnetic rotary armature cooperating with the core at the front end of the bobbin for driving the drive train, embossments at least on the base plate for securing the bobbin in a position in which the rear end of the bobbin is spaced from the adjacent side wall and parallel thereto to form a wide access space, a pair of spaced axially extending prongs mounted on the edge of the bobbin and projecting into the access space, the ends of the drive coil being connected to the respective prongs, means defining an access opening in the adjacent side wall of the housing alined with the prongs on the bobbin for providing communication with the access space, the access opening being of arbitrary cross sectional shape and of such small size as to preclude entry of an a-c. connector of conventional design, a line cord having a connector, the connector having a tip portion cross sectionally fitted for snug reception in the access opening and having a a handle portion, female electrical connections in the tip portion for engaging the prongs of resistor means in the handle portion in series with the line cord, the length of the tip portion being greater than the width of the access space so that the handle portion of the connector remains outside of the housing when the connector is plugged into the access opening for dissipation of the heat of the resistor means to the ambient atmosphere.

4,388,003

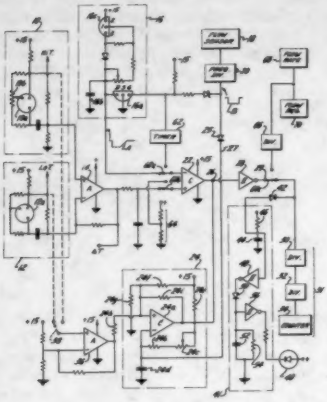
HEAT-METER AND FLOW-METER APPARATUS

Murray F. Feller, Dunnellon, Fla., assignor to Wilgood Corporation, Dunnellon, Fla.

Filed Apr. 29, 1981, Ser. No. 258,521
Int. Cl.³ G01F *1/86*; G01K *17/16*
U.S. Cl. 374—41 **6 Claims**

1. Heat metering apparatus for a system having a heat exchanger, an inlet passage, an outlet passage and means for moving fluid through said inlet passage, said heat exchanger and said outlet passage serially, said heat metering apparatus including a flow sensor at one of said passages operative to produce a series of pulses in response to fluid flow, a pair of temperature sensors located at said inlet and outlet passages, respectively, temperature difference means for taking the difference between the outputs of said temperature sensors, an oscillator, a heat meter, product-taking means responsive to both said flow sensor and said temperature difference taking means for enabling the oscillator to supply trains of pulses to the heat meter at intervals determined by said flow sensor for durations determined by said temperature difference taking

means, and compensating means controlled by the one of said temperature sensors for causing the oscillator frequency to



vary to compensate for temperature-related deviations in the response of the flow sensor to the mass-rate of fluid flow.

4,388,004

SHAFT BEARING ARRANGEMENT

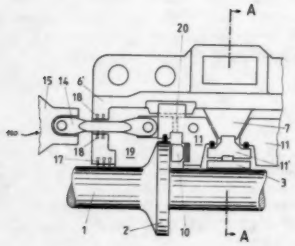
Hans Bellati, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Co. Ltd., Baden, Switzerland

Filed Jun. 4, 1981, Ser. No. 270,553

Claims priority, application European Pat. Off., Jun. 16, 1980, 80200559

Int. Cl.³ F16C *35/02*

U.S. Cl. 384—397 **7 Claims**



1. A bearing arrangement for rotating machines, especially for the shafts of multi-stage turbines, comprising:

at least one support bearing;

at least one thrust bearing;

a respective bearing support in which there are arranged the related support bearing and thrust bearing;

means defining a common bearing housing for the support bearing and the thrust bearing and the related bearing supports; and

the bearing support of the thrust bearing surrounding the bearing support of the support bearing and being supported at the bearing housing.

4,388,005

METHOD AND APPARATUS FOR PRINTING PARTIALLY OVERLAPPING CHARACTERS

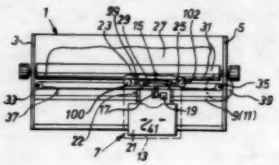
Hans Wehking, Jerxheim; Detlef Eichler, Braunschweig, and Wolfgang Klingenberg, Lahstedt, all of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 257,479

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014769

Int. Cl.³ B41J *1/30, 29/36*

U.S. Cl. 400—144.2 **7 Claims**



1. A method for generating plural imprints of a selected character on a record carrier medium, which imprints are close together, mutually offset and partially overlapping, in an office machine printer equipped with a typing element, the printer being arranged to produce lines of typed characters, in which method a relative movement takes place along a typing line between the typing element and the record carrier medium, said method comprising, in the order recited:

effecting an initial relative movement between the typing element and the record carrier medium in a first direction along the typing line to an initial position, and generating at least one imprint of the selected character;

effecting a second relative movement between the typing element and the medium by a given number of elemental steps, which number is equal to at least one, each having a length which is a fraction of the spacing between successive characters on a typed line, in the first direction from the initial position to a second position; and

effecting a third relative movement between the typing element and the medium by the same number of elemental steps as said second movement, in a second direction, opposite to the first direction, along the typing line, from the second position to a third position, and generating at least one further imprint of the selected character.

4,388,006

PRINTING RIBBON CARTRIDGE

Helmut K. Waibel, Fremont, Calif., assignor to Durango Systems, Inc., San Jose, Calif.

Filed Mar. 3, 1981, Ser. No. 239,981

Int. Cl.³ B41J *32/00, 32/02*

U.S. Cl. 400—195 **10 Claims**

1. An improved, U-shaped printing ribbon cartridge for use with printing ribbons, the cartridge being adapted to enclose the entire length of a printing ribbon other than a length exposed over an open end for printing, the cartridge including a ribbon feed aperture located at a first terminal end of a base of the U-shaped cartridge near said open end and a ribbon return aperture located at a second terminal end of the base near said open end for guiding a length of ribbon along a path across said open end, and a cartridge cover secured to said cartridge base by a plurality of pins distributed about a periphery of said cover, said base adapted to receive said pins by means of an equal plurality of mating apertures formed about said base periphery, said cover and said base mating surfaces meeting along a planar surface located partially across the cartridge height, and a ribbon storage compartment located within the base and having a ribbon entry aperture formed about a third terminal end of said ribbon storage compartment for admitting

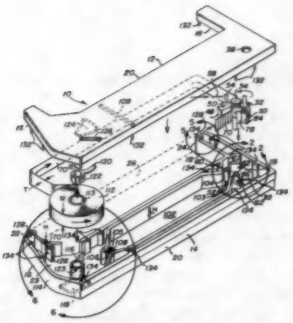
a length of ribbon thereto wherein the improvement comprises:

a toothed, ribbon driving wheel for advancing a ribbon under tension, the driving wheel being located within the cartridge intermediate said ribbon return aperture and said third terminal end of said ribbon storage compartment, the driving wheel being rotatable about an axis fixed with respect to the cartridge;

mechanical means directly engaged to the cartridge and a driving wheel chamber and manual means connected to the driving wheel to permit rotation of the driving wheel from outside the cartridge;

a spring loaded, toothed pinch wheel rotatably supported within the cartridge and urged into meshing engagement with the driving wheel; and

a mobius forming means for guiding a length of ribbon along a path comprised of a Z-shaped mobius guide formed by a rectangular shaped ribbon guide bar aligned essentially parallel to said ribbon path spanning said open end of said U-shaped cartridge and a triangularly-shaped ribbon tilting guide secured to each opposite terminal end of a common edge of said guide bar, wherein said opposing tilting guides are shaped as isosceles right triangles with triangular surfaces aligned essentially perpendicular to the length of said ribbon guide bar and altitudes of said triangles aligned essentially parallel to the width of said guide bar and bases of said triangles aligned essentially perpendicular to the width of said guide bar wherein said isosceles right triangles each have a hypotenuse which forms one arm of a "V" having a junction at said common edge of said guide bar causing said hypotenuses, to cross diagonally between opposing interior surfaces and further the mobius guide positioned transversely across a direct path between said ribbon exit aperture of the ribbon storage compartment and said ribbon feed aperture with an edge of said ribbon disposed immediately adjacent to one wall of the cartridge at an entry to said mobius forming means and disposed immediately adjacent to an opposing wall of said cartridge upon exit therefrom, said mobius forming means being rigidly but removably secured to a ribbon pin within the cartridge outside of a fourth terminal end of the ribbon storage compartment.



4,388,007

LINE FEED CARRIER RETURN MECHANISM FOR MOVABLE PRINTING POINT TYPEWRITER

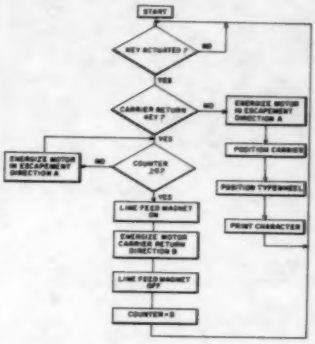
Heinz Meier, and Egon Zurawski, both of Berlin, Fed. Rep. of Germany, assignors to Triumph-Adler A.G. fur Buro- und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Jul. 24, 1981, Ser. No. 286,579

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 3034836

Int. Cl.³ B41J *19/70, 19/72*

U.S. Cl. 400—314 **3 Claims**



1. A typewriter having a frame,

a platen rotatably mounted on said frame,

a single element type carrier mounted for movement in escapement and carriage return directions relative to said frame between established left and right margins,

a bidirectional motor,

carrier drive means connected to said motor for moving said carrier in escapement and return directions according to the direction of energization of said motor,

platen indexing means,

a normally disengaged half revolution clutch coupled to said carrier drive means and operable when energized to couple said carrier drive means to said platen indexing means to effect upon energization of said motor over the full cycle of the engaged clutch, a line indexing movement during the return of said carrier to said left margin,

means for generating a carrier return command,

control means for energizing said bidirectional motor to move said carriage and said clutch in response to said carrier return command,

means responsive to said carrier return command for determined the distance of said carrier from said established left margin;

said control means energizing said motor in escapement direction if the determined distance is less than a predetermined number of spaces and then energizing said motor in carrier return direction and said clutch when the determined distance is greater than said predetermined number of spaces.

4,388,008

AUTOMATIC PAPER FEEDER

Jay R. Greene, Middleville; James W. Windecker, Jr., Ilion; James H. Roberts, West Winfield, and Harold F. Wood, Herkimer, all of N.Y., assignors to Advanced Terminals, Inc., Mohawk, N.Y.

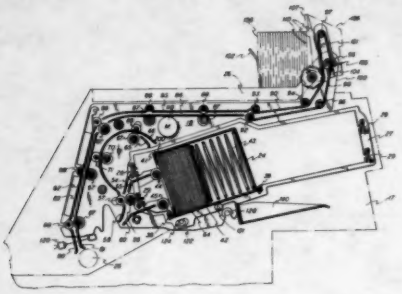
Filed Feb. 23, 1981, Ser. No. 237,516

Int. Cl.³ B41J *13/00;* **B65H** *3/44*

U.S. Cl. 400—578 **17 Claims**

1. An automatic paper feeder for use with a character printer having a platen, the feeder comprising an interface unit mounted on the printer and a paper cartridge-guide unit

mounted on the interface unit, a cartridge cradle assembly mounted in the cartridge-guide unit, the cradle assembly being adapted to receive paper containing cartridges of different types, one type of cartridge being adapted to contain cut paper and another type of cartridge being adapted to contain envelopes, scrub roll and guide means for removing paper from either type of cartridge and guiding it to the printer platen, a receiving station forming a part of the cartridge-guide unit for



receiving paper that has left the platen, and a paper guide assembly for guiding paper leaving the printer platen to the receiving station, the guide assembly having a terminal portion movable between a first and second position, the terminal portion in its first position being operable to deliver cut paper to the receiving station in a first in-first out arrangement, and the terminal portion in its second position being operable to deliver envelopes to the receiving station in a first in-first out arrangement.

4,388,009

COOLING SYSTEM FOR A LINE PRINTER

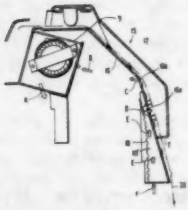
Ikuo Kumagai; Yukiaki Koyanagi, and Hiroshi Hidaka, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed May 30, 1980, Ser. No. 154,666

Claims priority, application Japan, Jun. 1, 1979, 54-69085; Jun. 1, 1979, 54-69086; Jun. 1, 1979, 54-74955[U]; Jun. 1, 1979, 54-74960[U]

Int. Cl.³ B41J *29/00*

U.S. Cl. 400—679 **5 Claims**



1. A line printer assembly comprising: a line printer, including:

a plurality of type characters;

a plurality of individually actuatable hammers, said type characters being impacted by said hammers;

a hammer actuator arrangement including a plurality of hammer actuators for individually actuating said hammers; and

a cross flow fan placed above said hammer actuator arrangement such that said cross flow fan longitudinally extends over an entire length of said hammer actuator arrangement, cooling air from said cross flow fan being directed to said hammer actuator arrangement from its upper side down to a bottom of said printer; and paper ejector means having a perforated paper guide plate provided at a rear of said printer; and an air inlet duct for said fan provided adjacent to said guide plate, air flowing into said inlet duct flowing into said fan via said perforations substantially vertical to said guide plate.

4,388,010

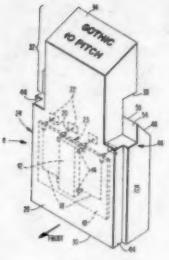
FONT MODULE FOR MATRIX PRINTER

William E. Mott, Versailles, and Iraj D. Shakib, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,694

Int. Cl.³ B41J *29/02*; H05K *1/00, 5/00*; G11C *5/02*

U.S. Cl. 400—692 **14 Claims**



1. For use in a matrix printer, a font storage module comprising:

a data storage device having at least one external communication port capable of transferring electrical signals, said storage device including stored information defining a set of printing patterns;

a generally rectangular housing enclosing said storage device, said housing having two generally parallel major surfaces that are spaced apart to define a first and a second set of relatively narrow opposing sides;

one of said major surfaces having defined therein a set of openings at which contact pads are located corresponding to said ports, said first set of sides including an insertion end surface which is opposite a side having a handle section said second set of opposing sides including at least one camming section that projects to define a rigid ramplike camming surface which terminates at one end in a surface that is sharply angled to said camming surface to define a latchable surface transition; and

connection means for coupling said contact pads to said ports.

4,388,011

MATERIAL DISPENSER TOOTHBRUSH

Donald R. Smith, 1601 Knoxville, Broken Arrow, Okla. 74012

Continuation-in-part of Ser. No. 77,342, Sep. 20, 1979, Pat. No. 4,277,194. This application Apr. 13, 1981, Ser. No. 253,178

Int. Cl.³ A46B *11/02*

U.S. Cl. 401—173 **8 Claims**

1. A material dispenser apparatus comprising an elongated cylindrical hollow handle, a central portion thereof being

internally threaded, an elongated sleeve member disposed with in the handle for carrying material to be dispensed and independently rotatable with respect to the handle, a pair of oppositely disposed longitudinal slots provided in said sleeve member, a dispenser drive member transversely disposed through said slots and having outer threaded ends in cooperative engagement with the internal threading of the handle, operator means at a first end of the handle operably connected to the sleeve member to impart said independent rotation of said sleeve member thereby causing the drive member to rotate and translate along said longitudinal slots for forcing material out of the opposite end thereof, and including a second operator means at a second opposite end of the handle which is operably connected to the sleeve member to impart said independent rotation thereto, each said operator means being provided with a longitudinal aperture for permitting selective dispensing of material through either end of the sleeve, and in combination with a disposable collapsible cartridge for carrying paste material to be dispensed, said cartridge being disposed within the sleeve member, a first end thereof being in contact with the dispenser drive member, a second opposite end thereof being provided with an opening alignable with the aperture of the second operator means.

4,388,012

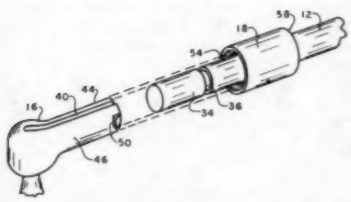
SWIVEL CONNECTOR

David A. Erickson, Hinsdale, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 23, 1980, Ser. No. 171,503

Int. Cl.³ F16B *3/00*; F16C *11/00*; F16D *1/12*

U.S. Cl. 403—142 **9 Claims**



1. A swivel connector assembly pivotally connecting an elongated member having a head defined at one end to a substantially spherical pivot comprising: a deformable connector body having a first socket which releasably receives said defined head and a second socket having a bearing seat which confines said pivot, slot means in said body intersecting said first socket and a portion of said second socket permitting expansion of said first and second sockets enabling insertion and removal of said head portion from said first socket and said pivot from said second socket, and sleeve means axially received over one end of said body precluding expansion of said first and second sockets, whereby when said pivot is positioned in said second socket, said head is positioned within said first socket, and said sleeve is received over said one end of said body a swivel connector assembly is formed which precludes disassociation of the pivot and elongated member.

4,388,013

PIPE CONNECTION AND METHOD FOR PRODUCTION

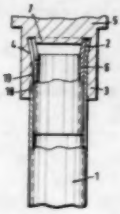
Hans Bergheim, and Winfried Griep, both of Bonn, Fed. Rep. of Germany, assignors to Vaw Leichtmetall GmbH, Dellweg, Fed. Rep. of Germany

Filed Oct. 9, 1980, Ser. No. 195,495

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1979, 2945474

Int. Cl.³ B25G *3/28*; F16G *11/00*

U.S. Cl. 403—277 **10 Claims**



1. A connection for joining a pipe with a pipe connection having a flange or a solid or hollow section comprising:

an inner pipe which is for most of its extent generally cylindrical and which has a widened generally frusto-conical end part;

an outer pipe connector receiving said inner pipe therein and having a generally frusto-conical undercut formed therein and receiving said widened end part; and

a sleeve mounted inside said inner pipe with a close tolerance so as to be substantially free from play, said sleeve being for most of its extent generally cylindrical and having a widened generally frusto-conical portion which engages said inner pipe internally, said inner pipe being retained between the undercut thereof and said frusto-conical portion of the sleeve, and means to prevent relative rotation of said pipe connector and inner pipe.

4,388,014

MULTIPLE PART TAPERED COLLAR FOR A TENDON ANCHORAGE SYSTEM

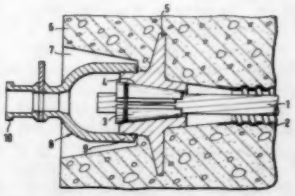
Johann Wlodkowski, and Dieter Jungwirth, both of Munich, Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 23, 1981, Ser. No. 227,597

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1980, 3002846

Int. Cl.³ B25G *3/20*; F16B *2/00, 7/04*

U.S. Cl. 403—369 **3 Claims**



1. Multiple part tapered collar for use as a component of a wedge anchorage system for a tendon in a structural concrete unit, comprising a plurality of axially extending parts combining to form an axially extending annular collar said parts of said collar having an inner surface and an outer surface with the inner surrace arranged to bear against the tendon in the form of a wire, rod or the like and with the outer surface arranged to bear against the surface of a frusto-conically shaped bore in an anchoring member, wherein the improvement comprises that

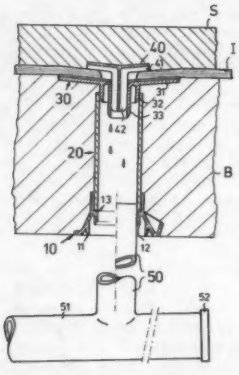
each of said parts have a first end and a second end with the outer surface thereof tapering inwardly from the first end to the second end, said parts combining to form longitudinal grooves extending in the axial direction of said collar for the axial length thereof between the first ends and second ends of said parts for forming a passage for the injection of neat cement or similar material around the tendon, said longitudinal grooves being formed in the outer surfaces of said parts of said collar and having a uniform depth for at least a major portion of the axial length thereof, each said part has a pair of axially extending edges in the assembled collar with a recess along the radially outer end of each said edge with the recess extending radially inwardly along the edge to a position intermediate the inner and outer ends of the edges, the recesses in adjoining edges of said parts forming said grooves.

4,388,015

DRAINAGE DEVICE EMBEDDED IN A CONCRETE SLAB FOR MOISTURE DRAINAGE

Heinz Honegger, Wil, Switzerland, assignor to Honel Holding AG, Ltd., SA, Rorbas, Switzerland

Filed Nov. 12, 1981, Ser. No. 320,182
Int. Cl.³ E01F *5/00*; E03F *1/00*
U.S. Cl. 404—2 **4 Claims**



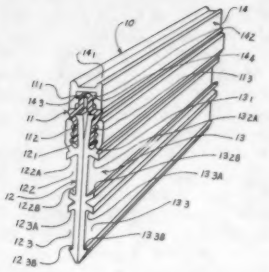
1. A device embedded in a concrete slab for drainage of moisture which collects between a waterproof isolating layer (I) applied to the top surface and the concrete slab itself, and-/or moisture which passes through a layer (S) deposited on the top of said isolating layer, said drainage device comprising; a drainpipe (**20**) embedded in said concrete slab (B) and having its upper end fitted with a shallow funnel (**30**) provided on its upper surface with radially extending grooves (**31**) and is flush with the top surface of said concrete slab, the upper end of the funnel opening being covered with a mushroom shaped insert (**40**) resting on said isolating layer, said insert having on its underside radially extending grooves (**41**), the bottom end of said drainpipe being supported in an outlet member (**10**) installed in said concrete slab in such a manner as to be flush with the underside thereof, said funnel (**30**) fitted on its underside with a centering cuff (**32**) concentrically surrounding tube (**33**) of said funnel (**30**) and spatially separating said tube (**33**) from said drainpipe (**20**), the diameter of said funnel tube (**33**) being at least about 20% smaller than the inner diameter of said drainpipe (**20**) to prevent dripping water from coming into contact with the interior wall of said drainpipe (**20**), and said outlet member (**10**) on the lower end of said drainpipe (**20**) having two concentric drip collars (**11, 12**).

4,388,016

EXPANSION JOINT AND SEAL FOR USE IN CONCRETE STRUCTURES

Bertram J. Levey, Covington, La., assignor to Construction Materials, Inc., Baton Rouge, La.

Filed Jun. 2, 1981, Ser. No. 269,619
Int. Cl.³ E01C *11/04*
U.S. Cl. 404—48 **7 Claims**



1. In apparatus constituting an expansion joint and seal device for use in sealing expansion joints in concrete constructions where, when plastic concrete block within which the device is installed and the concrete cured sufficiently the block cracks and is laterally separated to form an expansion joint between two adjacent concrete blocks each subject to thermal expansions and contractions, there is included an elongate flexible seal member inclusive of an expandable upwardly faced closed loop portion, a removable elongate top cap for affixing upon the loop portion of said elongate flexible seal member for covering same, and a pair of alternately disposed downwardly projecting leg portions extending from the non-closed sides of said loop portion,

the improvement comprising

a pair of elongate side frames, each of which includes upwardly faced deep U-shaped slots within which each of the leg portions of said expandable loop portion of the elongate flexible seal is extended, bonded, and attached by use of an adhesive, each of which contains on an outer surface, one or more pairs of inwardly sloped laterally aligned ribs which form longitudinal channels with relatively wide bottom surfaces with restricted surface outlets, which forms a means of tenaciously bonding plastic cement to said side frames to form a flexible seal, and

each of the side frames are formed from a unitary extruded extrudate mass of rigid plastic, or rubber, by severing side frames of equal length from said extrudate mass.

4,388,017

TROWELING BLADE ROTOR ASSEMBLY

Donald R. Morrison, 6228 Eagle Peak Dr., Charlotte, N.C. 28214

Filed Nov. 27, 1981, Ser. No. 325,276
Int. Cl.³ E01C *19/22*
U.S. Cl. 404—112 **1 Claim**

1. An improved troweling blade rotor assembly adapted for being driven by the drive shaft of a powered rotary-type trowel unidirectionally, comprising:

(a) a hub member having:

(i) a vertically-oriented, centrally-located collar for receiving the drive shaft of a rotary trowel;

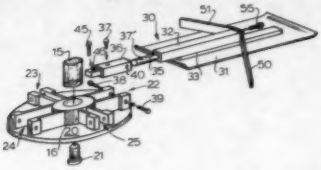
(ii) integral with said collar and extending radially outward therefrom, a plurality of circumferentially spaced blade-mounting arm receptacles; and

(iii) means for securing said shaft to said hub member;

(b) a plurality of radial blade mounting arms having the respective inner ends thereof pivotally mounted in respec-

tive said receptacles and pivotal only about horizontal axes passing through the respective said inner ends and oriented transverse of the respective longitudinal axes of said arms;

(c) screw adjusting means mounted on respective said inner end portions of each said mounting arm between said collar and said axes enabling the degree of tilt of said



mounting arms to be individually adjusted with respect to the horizontal plane and when under the influence of the weight of said machine bearing on said collar; and

(d) a trowel blade secured to each respective said arm and having the working surface thereof adjustable with respect to the horizontal plane by adjusting the respective said screw adjusting means located thereon.

4,388,018

ECCENTRIC-DISK TAMPER

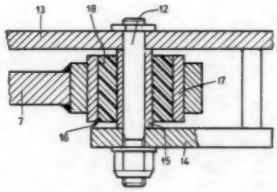
Marcel Boschung, Schmitten, Switzerland, assignor to Boschung Holding A.G. Freiburg, Fribourg, Switzerland

Filed Apr. 10, 1981, Ser. No. 252,853

Claims priority, application Switzerland, Mar. 6, 1981, 1563/81

Int. Cl.³ E01C *19/38*

U.S. Cl. 404—113 **5 Claims**



1. An eccentric-disk tamper of the type having a vibrator frame intended to be raisably and lowerably disposed on a vehicle, at least one vibrator unit, and at least one parallel linkage connecting said unit to said frame, each said parallel linkage including a plurality of guide rods pivoted to support members of said frame and said unit, a plurality of coupling links disposed at respective pivot points of said linkage, and a plurality of bolts forming part of said coupling links, wherein the improvement comprises:

a first metal sleeve surrounding and non-rotatably secured to each of said bolts in each of said coupling links,

a resilient cylinder for each link having one surface surrounding and non-rotatably secured to said first metal sleeve,

a second metal sleeve for each link surrounding and non-rotatably secured to the opposite surface of said resilient cylinder,

the resilient characteristic of said cylinder affording resilient relative rotation between said opposite surfaces about the cylinder axis,

one of said support members being non-rotatably connected to said first metal sleeve and one of said guide rods non-rotatably connected to said second metal sleeve, and

at least one stop means disposed between said support member and said guide rod to limit the angular displacement of said guide rod relative to said support member.

4,388,019

ARTIFICIAL REEF ASSEMBLY CONSTRUCTION

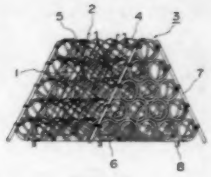
Kunio Kajihara, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 16, 1981, Ser. No. 254,982

Claims priority, application Japan, Dec. 8, 1980, 55-171983

Int. Cl.³ E02B *3/04*

U.S. Cl. 405—25 **7 Claims**



1. An artificial reef assembly construction which comprises an artificial reef assembly comprising a plurality of artificial reef units each comprising a hollow structure having at one end thereof a first opening and at the other end thereof a second opening and having a peripheral framework extending from the circumference of said first opening to the circumference of said second opening, said peripheral framework comprising a plurality of first fiber-reinforced plastic bands wound spirally about an axis of the hollow structure from said first opening to said second opening at an oblique angle with the axis and a plurality of second fiber-reinforced plastic bands wound spirally about the axis in a direction opposite to said first fiber-reinforced plastic bands, thereby forming lattice pattern windows respectively defined by said first fiber-reinforced plastic bands and said second fiber-reinforced plastic bands intersecting therewith;

a weight securely attached to the artificial reef assembly at its lower portion; and

a predetermined number of rods each including an engaging means;

said rods each including an engaging means being disposed on the artificial reef assembly at its both side walls in a direction perpendicular to the axis of the artificial reef unit and firmly secured to the reef units of which the outer partial peripheries constitute said side walls by winding, around portions of the rods and the artificial reef units in contact with each other, fiber glass rovings impregnated with a thermohardening resin, followed by curing of the resin.

4,388,020

METHOD AND APPARATUS FOR ADVANCING CYLINDRICAL BODIES UNDERGROUND

Koichi Uemura, No. 3-11, 1-chome, Sakura-machi, Koganei-shi, Tokyo, Japan, and Makoto Uemura, Koganei, Japan, assignors to Koichi Uemura, Tokyo, Japan

Continuation of Ser. No. 99,991, Dec. 4, 1979, abandoned. This application Sep. 1, 1981, Ser. No. 298,471

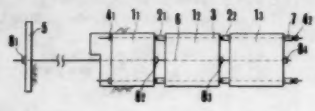
Claims priority, application Japan, Mar. 13, 1979, 54-28247; Mar. 17, 1979, 54-30556; Mar. 19, 1979, 54-31182; Apr. 2, 1979, 54-38432; Apr. 7, 1979, 54-41557

Int. Cl.³ E01G *5/14*

U.S. Cl. 405—138 **14 Claims**

1. A method for advancing two cylindrical bodies underground wherein a second cylindrical body is laid in the rear of a first cylindrical body; an anchor body is disposed underground in front of the first cylindrical body; an anchor member is arranged to have one end thereof anchored in said anchor body and to have the other end project from the rear end of the

second cylindrical body; an advancing jack is disposed in the rear of the second cylindrical body and is connected to the rear part thereof; a thrusting jack is operated to move forward the first cylindrical body with a required reaction force obtained



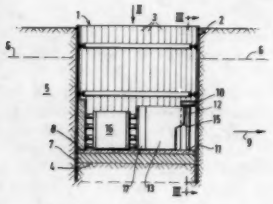
from a sum total of the reaction forces of said anchor body and said second cylindrical body; and then the thrusting jack is released and said advancing jack is operated to move the second cylindrical body forward with a required reaction force obtained from the reaction force of said anchor body.

4,388,021

METHOD OF AND DEVICE FOR MAKING CANALIZATION BY ADVANCING UNDER PRESSURE A STRING OF SEWER PIPES

Richard Weiss, Endstrasse 7, 4130 Moers, Fed. Rep. of Germany

Filed Aug. 26, 1981, Ser. No. 296,520
Int. Cl.³ E03F *3/06;* E21D *1/00*
U.S. Cl. 405—184 **1 Claim**



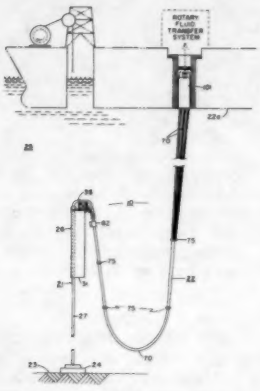
1. A method of making canalization by advancing under pressure a string of sewer pipes in a water-conductive ground defining an underground water level, comprising the steps of forming in the ground at least one shaft or trench having a floor by driving sheet piling excavating sod between the sheet piling; feeding water in the excavation to maintain the original water level; laying a layer of concrete setting underwater on the floor; after setting of the concrete layer, removing water from the shaft or trench; thereafter forming a concrete base tub on the layer of concrete for supporting respective sewer pipes; forming a concrete front partition at one side of the shaft or trench through which the consecutive sewer pipes are to be advanced, the partition having a starting opening communicating with the base tub, the opening being provided with a sealing ring of a resilient material on its inner surface; inserting a tubular cutting member snugly fitting the sealing ring into the opening and closing the communication between the interior of the cutting member and the shaft; then lifting a portion of the sheet piling in the range of the starting opening; and pressing consecutive sewer pipes against the rear end of the cutting tool in the direction of advancement.

4,388,022

FLEXIBLE FLOWLINE BUNDLE FOR COMPLIANT RISER

Larry L. Gentry, Sunnyvale; Herbert H. Moss, Cupertino, both of Calif.; Narayana N. Panicker, Grand Prairie, Tex.; William T. Wada, Sunnyvale, Calif., and Irvin R. Yancey, Irving, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,324
Int. Cl.³ F16L *1/04;* B63B *35/00*
U.S. Cl. 405—195 **12 Claims**



1. In a marine compliant riser system wherein a catenary flexible flowline bundle is connected between a surface facility and a submerged lower riser section, the improvement which comprises:

a flexible flowline bundle having means for attaching a plurality of flexible conduits at a bottom portion of the surface facility for rotation relative to the surface facility, the conduits being attached thereto at radially disposed spaced attachment points and depending therefrom at a substantially vertical catenary angle of departure;

a plurality of spreader beams adapted for holding the flexible conduits in parallel spaced-apart relationship and comprising guide means for loosely retaining each of said flexible conduits in substantially linear array while permitting longitudinal movement thereof;

means for maintaining the spreader beams longitudinally spaced along the flowline bundle; and

means for connecting the parallel-spaced conduits at a substantially vertical catenary departure angle to corresponding points on the submerged lower riser section in linear array to establish fluid communication through the rigid riser section and flexible flowline.

4,388,023

TRUSS ARRAY FOR SUPPORTING DEVICES WITHIN A FLUID MEDIUM

Peter R. Cochrane, Kingston, Mass., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,781
Int. Cl.³ B63B *21/00*
U.S. Cl. 405—195 **16 Claims**

1. An apparatus for supporting within a fluid medium of known density one or more devices in a horizontal position, said apparatus comprising:

a first mass;

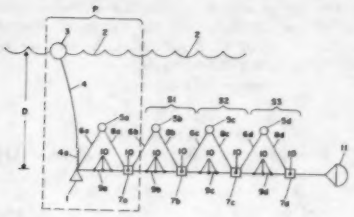
first means for supporting said first mass at a given position within the fluid medium;

a second mass having a density less than the known density of the fluid medium;

second means for connecting said second mass to said first mass;

a third mass having a density greater than the known density of the fluid medium;

third means for connecting said third mass to said second mass and said first mass;



means for deploying said apparatus; and

fourth means for supporting the devices, said fourth means being connected between said first mass and said means for deploying.

4,388,024

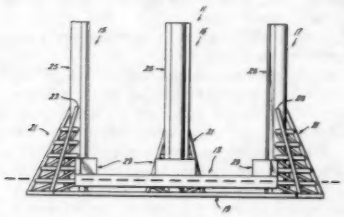
SUPPORT STRUCTURE FOR OFFSHORE PLATFORMS

Edward D. Dysarz, Houston, Tex., assignor to James G. Brown & Associates, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 73,308, Sep. 7, 1979, and Ser. No. 94,360, Nov. 15, 1979, which is a continuation-in-part of Ser. No. 73,308,. This application Jul. 9, 1980, Ser. No. 167,041

Int. Cl.³ E02B *17/02*

U.S. Cl. 405—198 **6 Claims**



1. A rig for use in supporting and using equipment above the ocean bottom, comprising:

a body;

leg means connected to said body for supporting said body above such ocean bottom;

said leg means including elevation means for elevating said body above such ocean bottom and connection means for connecting said elevation means to said body and at least three legs, each of said legs having

a first end and a second end, said legs having a first portion of variable cross-sectional area extending from said first end to a first position intermediate to said second end and a second portion of variable cross-sectional area extending from said first intermediate position to a second position intermediate to said second end and a third portion being of substantially constant cross-sectional area from said second intermediate position to said second end, the cross-sectional area of said first portion being greatest at said first end and decreasing moving from said first end to said first intermediate position, the cross-sectional area of said second portion being greatest at said first intermediate position and decreasing moving from said first intermediate position to said second end, the cross-sectional area of said third portion being no greater than the cross-sectional area of said second portion, the cross-sectional area of said second portion being no greater than the cross-sectional area of said first portion.

4,388,025

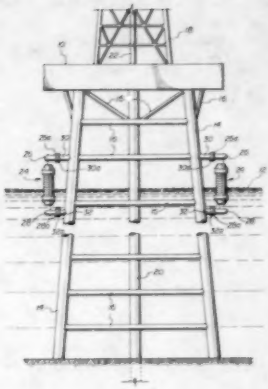
GUARD FOR OFFSHORE STRUCTURE

Orde R. Evans, Lafayette, La., assignor to Oreco III, Inc., Lafayette, La.

Filed Jun. 2, 1980, Ser. No. 155,060

Int. Cl.³ E02B *3/22*; B63B *21/00*

U.S. Cl. 405—212 **10 Claims**



1. A guard device for disposition adjacent an offshore structure to protect said structure from impact, comprising:

a generally tubular body of resilient material comprising a stack of elastomeric rings disposed in longitudinally aligned, end-to-end relation;

a pair of connection means adjoined to said positioning means and disposed adjacent axially opposite ends of said tubular body for connection to said offshore structure; and

means for applying a longitudinal compressive load to said stack of rings and including flexible positioning means extending longitudinally through the bore of said tubular body and a pair of abutment members abutting respective upper and lower ends of said stack of rings, said positioning means being connected to said abutment members and adapted to urge said abutment members longitudinally toward each other, said positioning means comprising first and second generally parallel flexible lines, said first flexible line having first stop means carried on its lower end and engageable with the lower of said abutment members to limit upward movement of said first flexible line with respect to said lower abutment member, the upper end of said first flexible line being adjoined to the upper of said connection means, said second flexible line having second stop means carried on its upper end and engageable with the upper of said abutment members to limit downward movement of said second flexible line with respect to said upper abutment member, the lower end of said second flexible line being adjoined to the lower of said connection means.

4,388,026

HOPPER DISCHARGE OUTLET

Daniel R. Green, Griffith, Ind., assignor to Union Tank Car, East Chicago, Ind.

Filed Apr. 30, 1981, Ser. No. 258,973

Int. Cl.³ B65G *53/50*

U.S. Cl. 406—130 **6 Claims**

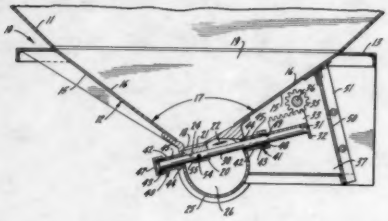
1. A hopper outlet for discharging a solid commodity comprising:

A. means defining a sloping surface that terminates adjacent a discharge slot;

B. an outlet gate below said sloping surface movable along a predetermined path to open and close said slot, there being an opening passing through said gate, said opening extending generally parallel to said path;

C. an elongated gate operating member extending through said opening and protruding beyond the opposite sides of said gate, bearing means supporting said operating member on opposite sides of said gate, a rack attached to said operating member and a pinion meshing with said rack for causing movement of said operating member along said path when said pinion is rotated;

D. means for releasably attaching said gate to said operating member comprising a first hole through said gate intersecting said opening, a second hole through an intermediate portion of said operating member, said first and second holes being aligned in said opening and being generally perpendicular to said path, a pin movable in a direction generally perpendicular to said path passing through said first and second holes for attaching said first and second holes for attaching said gate to said operating member, and means releasably holding said pin in said first and second holes; and



E. means defining an enclosed elongated trough beneath said gate, said pin being removable from one of the ends of said trough, whereby removal of said pin and subsequent movement of said operating member out of said opening permits said gate also to be removed through one of the ends of said trough.

4,388,027

PROCESS FOR MILLING LONG WORKPIECES

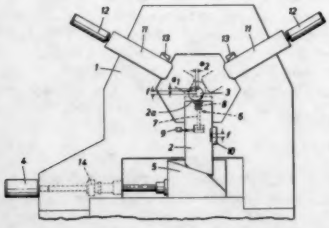
Gottfried Blaimschein, Steyr, Austria, assignor to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H., Steyr, Austria

Filed Sep. 11, 1980, Ser. No. 186,112

Claims priority, application Austria, Oct. 16, 1979, 6722/79

Int. Cl.³ B23B *5/18*; B23C *3/06*

U.S. Cl. 409—131 **5 Claims**



1. In a process of subjecting a long workpiece to a preliminary rough-milling operation causing distortion of the long workpiece by a plastic deformation and a subsequent finish-milling operation while supporting the workpiece near the center of its length, the improvement of

(a) initially holding the rough-milled workpiece in a position wherein it has a free sag near the center of its length, the free sag causing an elastic deformation of the long workpiece

(b) determining the extent of the free sag, and

(c) supporting the workpiece near the center of its length sufficiently to eliminate solely the elastic deformation and without eliminating the distortion of the long workpiece while finish-milling the workpiece.

4,388,028

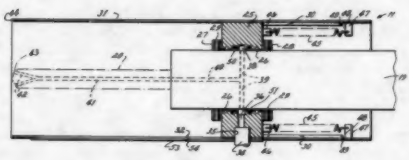
SPLASH GUARD

Michael L. Bodin, 859 Old Mill Dr., Loveland, Ohio 45140

Filed Dec. 29, 1980, Ser. No. 221,345

Int. Cl.³ B23C *9/00*; B23B *47/00*

U.S. Cl. 409—136 **6 Claims**



1. A splash guard for use in combination with a rotary tool having coolant flow passages extending through the tool to the tool cutting edges, said splash guard comprising

a non-rotatable coolant flow inducer ring adapted to be mounted over a rotatable portion of said tool,

thrust rings located upon opposite sides of said coolant flow inducer ring for securing said non-rotatable inducer ring to said rotary tool,

means for fixedly securing said thrust rings to said rotatable portions of said tool,

a coolant flow conduit connected to said inducer ring for supplying liquid coolant to said inducer ring,

coolant flow passageway means extending through said inducer for connecting said coolant flow conduit to the coolant flow passages in said rotary tool,

sealing means for forming a liquid seal between the non-rotatable inducer ring and said rotatable tool,

guide means extending generally longitudinally from one side of said inducer ring,

a splash shield sleeve mounted over said inducer ring and said guide means, said sleeve being longitudinally slideable relative to said inducer ring and guide means, and

spring means connected to said inducer ring and to said sleeve for biasing said sleeve to an extended position in which said sleeve extends longitudinally over the cutting edge of said rotary tool, said spring means permitting said sleeve to be forced by contact with a workpiece longitudinally away from said cutting edge as said rotary tool cuts into said workpiece.

4,388,029

CONDITIONING APPARATUS FOR CASE METAL BARS

Helmut E. Durr, Dunwoody, and George E. Mock, Duluth, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

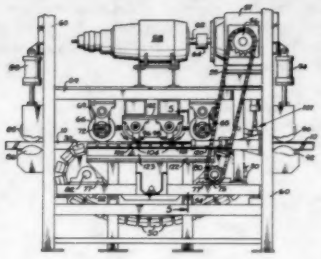
Filed Apr. 14, 1980, Ser. No. 140,264

Int. Cl.³ B23C *1/22*; B65G *17/10*

U.S. Cl. 409—295 **6 Claims**

6. Conditioning apparatus for a cast metal bar comprising an endless conveyor; means for driving said endless conveyor along a circuitous path that extends generally linearly through a bar conditioning station; means for holding a cast metal bar on said endless conveyor at the bar conditioning station with-

out substantial relative movement between the bar and bar supporting portions of said conveyor at the bar conditioning station; means for trimming a cast metal bar supported on said endless conveyor at the bar conditioning station; a pair of deflector plates straddling said conveyor at the bar conditioning station with each deflector plate mounted along an incline overlaying a portion of said endless conveyor; and means for flushing bar trimmings from a cast metal bar supported on said conveyor onto said deflector plates and from said endless conveyor at the bar conditioning station.

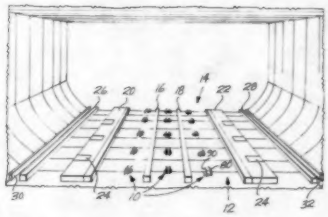


4,388,030

ENDWISE PUSHDOWN GUIDE AND LATERAL RESTRAINT FITTING FOR CARGO

Douglas E. Skaale, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 24, 1980, Ser. No. 220,017
Int. Cl.³ B60P *1/64;* B64C *1/20, 1/22*
U.S. Cl. 410—69 **11 Claims**



1. An endwise pushdown guide and lateral restraint fitting for cargo, comprising:

a base;

two juxtaposed laterally spaced generally upright blades for laterally restraining cargo, said blades being pivotally mounted on said base;

said base supporting two laterally spaced juxtaposed pivot pins;

each blade being mounted to pivot on a respective pivot pin remote therefrom;

a coil spring to normally retractably secure said blades in an upper pivotal position in a direction upwardly from said base, said spring having one end associated with one blade and the other end associated with the other blade so as to bias said blades toward and in said upper pivotal position;

each respective blade being pivotal toward said base from said upper position when a force acting on and through a respective blade is applied to said coil spring through the association of the blade and spring; and

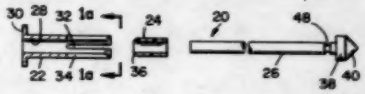
means on each respective blade to receive said force and to direct a downward component of said force in a direction transverse to the force and downwardly toward said base to pivot the respective blade toward the base and below the force source.

4,388,031

BLIND FASTENER DEVICE

Earl T. Rodgers, 3172 Meadowbrook Dr., Concord, Calif. 94523

Filed Oct. 3, 1980, Ser. No. 193,654
Int. Cl.³ F16B *13/06*
U.S. Cl. 411—43 **6 Claims**



1. A fastener device for installation in at lease one structural member to hold it to another member or to provide an anchor therein, said device comprising:

a main rivet body formed of relatively soft and readily bendable material having an enlarged head at one end with a central bore and a series of spaced apart slot means extending axially from its other end throughout a substantial portion of the axial extent of said rivet body to form bendable sectors;

an elongated pin substantially longer than said rivet body, having a shank with a constant diameter and an enlarged integral pin head at one end having a bearing shoulder extending at substantially right angles to the longitudinal axis of said pin, said pin shank being adapted to extend through said central bore of said rivet body;

a generally cylindrical sleeve shaped member of readily, deformable flowable material surrounding said pin located between and axially aligned with said bendable sectors of said rivet body and said pin head bearing shoulder, the diameter of said bearing shoulder being substantially at least as great as the outer diameter of said sleeve shaped member, said sleeve shaped member having an external frusto conical surface on one end adjacent to and engageable with an internal frusto conical surface at the end of said rivet body having said slot means, said sleeve shaped member being adapted to press against and splay apart said bendable sectors by becoming progressively larger in diameter when compressed by axial force exerted against one end of said sleeve member by said pin head;

whereby said bendable sectors are caused to extend radially from said rivet body and pressed generally flat against the inner surface of said structural member.

4,388,032

LIFTING AND STOWAGE SYSTEM

Robert A. Stobler, Paulsbo, and Benjamin D. Murray, Bremerton, both of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 30, 1980, Ser. No. 202,213
Int. Cl.³ B60P *7/10;* B63B *25/22;* B65G *57/30*
U.S. Cl. 414—95 **2 Claims**

1. A lifting and stowage system comprising:

(a) a carriage, said carriage including a snatch block pin and a buffer striker;

(b) first and second strongbacks, one end of each of said first and second strongbacks rigidly connected to said carriage in spaced apart and parallel relationships, said first strongback including first and second lifting pins, said second strongback including third and fourth lifting pins;

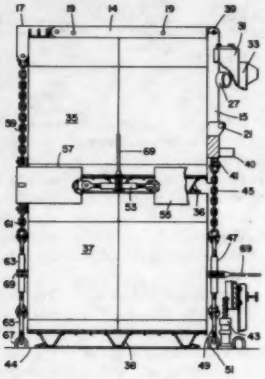
(c) first and second guide rails, said first and second guide rails mounted in a vertical spaced apart, parallel relationship;

(d) first and second rollers, said first and second rollers

rotatably mounted on said carriage and respectively in engagement with said first and second guide rails;

(e) lifting means for raising and lowering said carriage by engaging said snatch block, said lifting means including a cable fixed at one end, drive means connected to the other end of said cable, means for supporting said cable in the horizontal position above said carriage, a snatch block including a pulley and a hook, said pulley being supported by said cable, whereby said snatch block is lowered when said drive means releases said cable and is raised when said drive means tightens said cable;

(f) a buffer mounted on a deck, said buffer striker positioned



to engage said buffer when said carriage is lowered to its lower most position;

(g) a first and a second container, said first container connected to said first, second, third and fourth lifting pins and raised to an elevated position by said carriage, said second container being positioned under said first container and said first container being loaded onto said second container; and

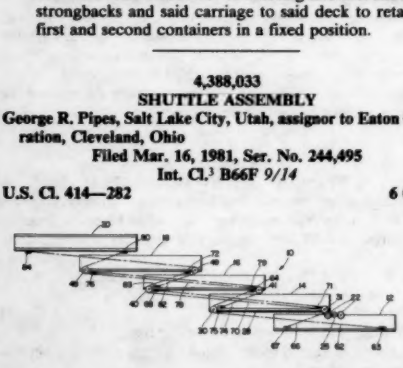
(h) tie down means for tieing down said first and second containers, said tie down means including a plurality of chain and load binders for connecting said first and second strongbacks and said carriage to said deck to retain said first and second containers in a fixed position.

4,388,033

SHUTTLE ASSEMBLY

George R. Pipes, Salt Lake City, Utah, assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 16, 1981, Ser. No. 244,495
Int. Cl.³ B66F 9/14
U.S. Cl. 414—282 **6 Claims**



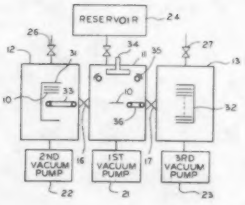
1. In a shuttle assembly operable between a retracted condition and an extended condition to move a load, comprising a stationary element; a plurality of stacked elongated elements movable relative to one another in a generally horizontal plane, said movable elements comprising one or more intermediate elements and a load engaging element; drive means interconnecting said stationary and movable elements and operable to move said movable elements telescopically to extend said load engaging element to a position remote from said stationary element; substantially straight guide channel means formed in said stationary and intermediate elements parallel to the direction of motion of said movable elements; first and second rollers mounted adjacent the ends of each of said intermediate and load engaging elements for rotation within the guide channel means of an adjacent element; and third and fourth intermediate rollers mounted on each of said intermediate and load engaging elements between said first and second rollers for rotation within the guide channel means of an adjacent element; the improvement wherein the first and second rollers of at least one of said movable elements are offset upwardly in relation to the remaining rollers on said element; and the guide channel means in which said offset rollers are received are flared upwardly adjacent the ends thereof.

4,388,034

PROCESSING APPARATUS COMPRISING A CASSETTE MEMBER TEMPORARILY SWINGABLE TO VERTICALLY HOLD A PLURALITY OF SUBSTRATES

Nobuyuki Takahashi, Fuchu, Japan, assignor to Anelva Corporation, Tokyo, Japan

Filed Jul. 29, 1981, Ser. No. 287,924
Claims priority, application Japan, Jul. 30, 1980, 55-104532
Int. Cl.³ C23C 13/08
U.S. Cl. 414—331 **5 Claims**



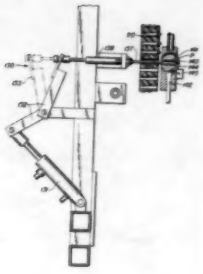
1. A processing apparatus comprising a processing chamber defining a processing hollow space, means coupled to said processing hollow space for processing a sheet-like unprocessed substrate to provide a processed substrate, an inlet chamber defining an inlet hollow space, a first cassette member for holding a stack of unprocessed substrates in said inlet hollow space with each unprocessed substrate kept substantially parallel, means for transferring one substrate from said stack at a time into said processing chamber, an outlet chamber defining an outlet hollow space, means for transferring the processed substrate from said processing hollow space into said outlet hollow space, and a second cassette member for receiving the transferred substrate in said outlet hollow space as a stack of processed substrates with each processed substrate kept substantially parallel, wherein the improvement comprises moving means coupled at least to a selected one of said first and said second cassette member for reversibly moving the selected cassette member between a home position and a temporary position, said selected cassette member holding the substrates with each substrate kept substantially horizontal and vertical when moved to said home and said temporary positions, respectively.

4,388,035

DIBBLE TUBE SOIL PLUG PLANTER

David W. Cayton; Errol C. Armstrong, and Angus B. MacKenzie, all of Salinas, Calif., assignors to Bud Antle, Inc., Salinas, Calif.

Continuation of Ser. No. 62,667, Aug. 1, 1979, Pat. No. 4,294,179. This application May 8, 1981, Ser. No. 261,766
Int. Cl.³ B65G 47/52; A01C 11/00
U.S. Cl. 414—417 1 Claim



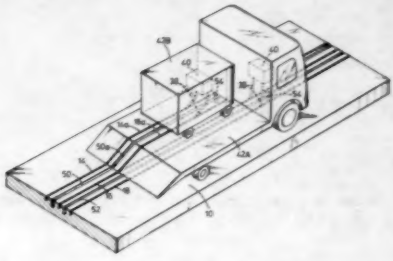
1. The apparatus for discharging soil plugs having seedling growing therein comprising: rigid carrying trays defining plug receiving apertures extending between the top and bottom thereof for forming successive columns of plant plugs; at least one plug comprising intermixed soil and binder having a seedling plant disposed therein, each said plug within a supporting aperture in said rigid carrying tray having a bottom soil portion exposed on one side of said rigid carrying tray, a top and plant protruding portion on the other side of said rigid carrying tray and having a plug longitudinally extending between said bottom and top with said rigid carrying tray forming the sole support for said plug; paired and opposed tray support members for holding said rigid carrying tray vertically at the edges thereof only and conveying said rigid carrying trays along a path; conveyor means for restricting the path of travel of said rigid carrying tray between said support members to thereby transport successive apertures containing plugs for extraction at an extraction station; at least one receiving station juxtaposed to said extraction station for receiving from said rigid carrying tray said plugs, said receiving station disposed to receive plugs from the top side of said rigid carrying tray; at least one plant discharging member for penetrating through the bottom side of defined plug receiving aperture in said rigid carrying tray and contacting said plug at said soil exposed portion to cause at least one plug to be dislodged from said defined plug receiving aperture of said rigid carrying tray and discharged from its respective defined plug receiving aperture in said rigid carrying tray to and towards said receiving station; and means for vertically registering said rigid carrying tray in successive columns to said extraction station operatively connected to said conveyor means whereby plugs from said successive columns can be discharged from said rigid carrying tray, said rigid carrying tray forming the sole supporting substrate between said paired and opposed tray support members for the conveyance and discharge of plugs at said extraction station to said receiving station.

4,388,036

TOY CAR AND ROADBED UNIT

Shozo Okamoto, Tokyo, Japan, assignor to Yonezawa Toys Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,157
Claims priority, application Japan, Nov. 28, 1979, 54-153901; Nov. 28, 1979, 54-153902; Nov. 28, 1979, 54-153903; Nov. 28, 1979, 54-153904
Int. Cl.³ B60P 3/06; B60L 15/32
U.S. Cl. 414—537 9 Claims



1. A toy car and road bed unit comprising a road bed having at least one set of three conductive paths running in parallel uniform-spaced relationship to each other, a guide channel located between the center one of the conductive paths and each of the other conductive paths, a DC power source having a center terminal connected to the center one of the conductive paths and a positive and negative terminal selectively connected to each of the other conductive paths, to form two tracks having the center conductive path in common, at least one toy car, each car having collector means depending therefrom and spaced for contact with the center conductive path and one of said other conductive paths and a pin adapted to enter into said channel associated with said track.

8. The unit as claimed in any one of claims 1 to 5 wherein the toy car adapted to run on the road bed comprises a parent toy car having a car body which extends over two electric tracks and having collectors for running along only one electric track, said parent toy car being provided on the body with two auxiliary conductive paths forming an auxiliary track and a baby toy car removable from the parent car adapted to run on the auxiliary track.

4,388,037

HOIST ACCESSORY FOR PALLET TRUCKS

Alfred Suarez, 3286 Woody La., San Jose, Calif. 95132

Filed Feb. 5, 1981, Ser. No. 231,604
Int. Cl.³ B66F 9/19
U.S. Cl. 414—607 8 Claims

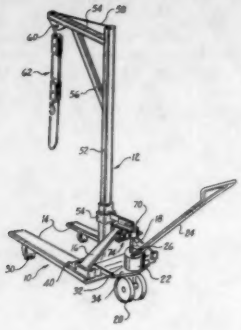
1. Hoist accessory apparatus for pallet trucks and the like of the type having a pair of horizontally extending forks extending in one direction relative to an upstanding shroud and a tongue portion extending in the opposite direction relative to the shroud, comprising:

means forming a base for resting upon the forks of a pallet truck and including clamping means for clamping the base to the shroud of the pallet truck;

hoist means;

support means affixed to said base and extending upwardly to support said hoist means above said forks; and

fastening means for securing said support means to the forwardly extending tongue of the pallet truck, said fastening



means acting in combination with said clamping means to rigidly secure said hoist apparatus to said pallet truck.

4,388,038

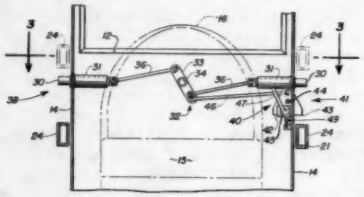
AUTOMATIC LOCKING PIN RETRACTION MECHANISM

Lonny R. Freitag, Lancaster, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Apr. 22, 1981, Ser. No. 256,455

Int. Cl.³ E02F *3/16*

U.S. Cl. 414—685 **10 Claims**



1. In a loader having a mobile frame, including upwardly extending, laterally spaced side members; a boom structure, including a pair of arms pivotally mounted on said frame such that each of said pair of arms is moveable along a generally vertical path adjacent a corresponding side member; power means operatively associated with said boom structure for raising and lowering said arms along said path of movement; a pair of locking pins, each respective said locking pin being mounted on a corresponding said side member adjacent the path of movement of the respective said boom arm, each said locking pin being positionable between a retracted position in which said locking pin is retracted within the respective said corresponding side member out of said path of movement of said boom arm and an extended position in which said pin is projected from said side member into said path of movement to be engageable with the respecitve said boom arm, said boom arms being supportable on said locking pins when said locking pins are in said extended position to prohibit downward movement of said boom arms below said locking pins; and means interconnecting said locking pins for simultaneously actuating the movement of said pins between said retracted position and said extended position, the improvement comprising:

automatic retraction means mounted on said side members below at least one of said locking pins and operatively connected to said means for simultaneously actuating said locking pins for automatically retracting said locking pins under conditions where said locking pins are in said locking position, said boom arms are positioned below said locking pins and said boom arms are moving upwardly toward engagement with said locking pins, said automatic retraction means retracting said locking pins before said boom arms can move upwardly into engagement with said locking pins.

4,388,039

TUBE FEEDING DEVICE

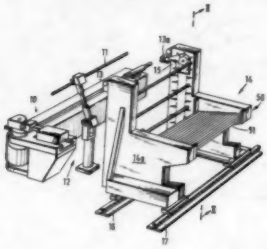
Rigobert Schwarze, Olpener Str. 460-474, 5000 Köln 91, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 201,323

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1979, 2943769

Int. Cl.³ B65G *47/06*

U.S. Cl. 414—748 **12 Claims**



1. A tube feeding device, particularly for a bending machine, comprising a tube magazine where tubes are positioned in a stock side by side and upon each other, said magazine having a bottom portion; means for receiving tubes from said tube magazine; means for removing tubes from said tube magazine positioned in said bottom portion and including a recess to receive an individual tube, said recess extending in the direction of elongation of the tubes located in said tube magazine, carriage means positioned in said bottom portion and provided with at least one drive motor adapted to move the carriage means towards and away from said tube receiving means in a direction transverse to said direction of elongation of the tubes, said tube receiving means being located outside said tube magazine, said tube receiving means and said tube removing means being two units forming mirrow images of each other and being spaced from one another at a distance corresponding to the length of the tubes to be treated, each of said units having an inner lateral wall facing the inner lateral wall of another unit, each unit further comprising two opposite end walls projecting between said inner lateral walls and forming a front bearing surface and a rear bearing surface for the tubes located in said tube magazine; and guide rails, said units having wheels being arranged to move on said guide rails, each unit being provided with a handle, which drives a gear which in turn cooperates with a rack positioned on one of the guide rails so as to adjust said distance for a predetermined length of the tubes to be treated.

4,388,040

ROTARY FLUID PUMP

Hiroshi Sakamaki, Utsunomiya, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1980, Ser. No. 212,960

Claims priority, application Japan, Dec. 14, 1979, 54-172389[U]; Dec. 14, 1979, 54-172392[U]

Int. Cl.³ F03B *11/00*; F04D *29/04*

U.S. Cl. 415—174 **11 Claims**

1. A rotary fluid pump comprising:

a rotary shaft;

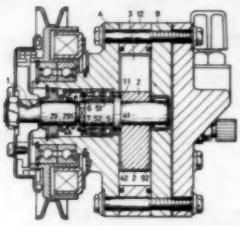
a front housing;

a center housing;

a rear housing;

a rotor having vanes adapted to be rotated by said rotary shaft in a space defined by said front housing, said center housing and said rear housing, said rotary shaft being rotatably supported at both ends thereof;

bearing means through which said rotary shaft is coupled to said front housing; said bearing means comprising two ball bearings each having inner and outer races; widths, in an axial direction of said rotary shaft, of confronting sides of said inner races being different from widths of confronting sides of said outer races, respectively;



first means for fixedly securing said inner races to said rotary shaft by tightening said inner races from opposite outer sides in the axial direction;

second means for fixedly securing said outer races to said front housing by tightening said outer races from opposite outer sides in said axial direction;

said two ball bearings being tightened by said first and second securing means to prevent axial displacement of said rotor and rotary shaft when a thrust force is applied thereto.

4,388,041

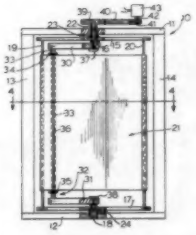
ROTATING SAIL FLUID CURRENT MOTOR

Ralph Dorr, 316 Southland Dr., Danville, Va. 24541

Filed Sep. 8, 1980, Ser. No. 184,778

Int. Cl.³ F03D *3/02*

U.S. Cl. 416—119 **9 Claims**



1. A fluid-powered motor, comprising:

(a) outer frame means adapted for fixed placement in a fluid stream and further adapted for mounting a selected number of inner frames rotatable about an axis passing through the outer frame means and located midway between and parallel to a pair of opposed sides of each said inner frame;

(b) a selected number of flexible, rectangular sails;

(c) a number equal to said selected number of inner frames, each said inner frame having a central axis passing through said outer frame means and located on the inner frame midway between and parallel to a pair of opposed sides thereof and comprising the axis about which each such inner frame is rotatably mounted on said outer frame and each said inner frame pivotally supporting on and extending between said opposed sides a respective said sail widthwise by the ends thereof with some predetermined slack and oriented for being operated on by said fluid;

(d) sail guide means adjustably secured to and positionable relative to said outer frame means and within the space in which said number of inner frames rotate and providing a linear guide surface spanning and continuously engaging the width of each said sail intermediate the length thereof without obstructing rotation of said number of inner frames whereby with said outer frame means appropriately fixed in a selected stream of fluid moving in a given direction, said guide means is adapted to be adjustably positioned with respect to said outer frame means to control the curvature and area of each sail exposed to particular portions of said fluid in various rotative positions of each respective said inner frame thereby with said guide means fixed in an optimum position enabling constantly changing portions of the surfaces and sides of each said sail under the influence of the force of said fluid to cyclically curve and thereby drive and rotate each said inner frame; and

(e) drive apparatus connected to be driven by each said inner frame during rotation thereof.

4,388,042

ROTOR FOR TURBO ENGINES

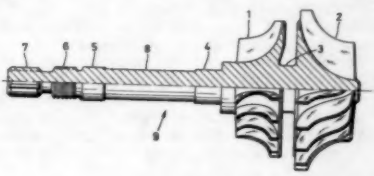
Thomas Weber, Oberursel, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 29, 1980, Ser. No. 154,529

Claims priority, application Fed. Rep. of Germany, May 29, 1979, 2921704

Int. Cl.³ F01D *5/34*

U.S. Cl. 416—198 A **1 Claim**



1. A rotor for gas turbine machines wherein the turbine machines operate at high speeds and temperatures, the rotor comprising:

a shaft having first and second ends;

a turbine vane wheel consisting of cast, unmachined vanes formed integrally with the shaft by virtue of being cast therewith and projecting radially from the shaft adjacent the first end thereof;

a compressor vane wheel consisting of cast, unmachined vanes formed integrally with the shaft by virtue of being cast therewith and projecting radially from the shaft at a location spaced from and inboard of the turbine vaned wheel;

a sealing surface disposed between the vaned wheels, the sealing surface being integral with the shaft by virtue of being cast therewith and being machined to provide a smooth surface;

a first bearing surface disposed adjacent to and inboard of the compressor vane wheel, the first bearing surface being integral with the shaft by virtue of being cast therewith and being machined to provide a smooth surface;

a second bearing surface spaced from the first bearing surface, the second bearing surface being integral with the shaft by virtue of being cast therewith and being machined to provide a smooth surface;

a helical thread adjacent to and outboard of the second bearing surface, the helical thread having a machined surface, and

a spline positioned adjacent to the helical thread and at the

second end of the shaft, the spline having a machined surface for receiving a gear;

whereby,

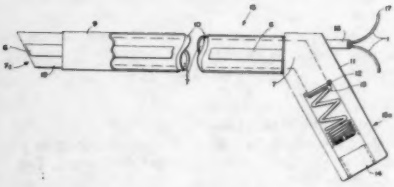
a unitary rotor made from a single unit of material is provided, which rotor is relatively inexpensive to manufacture and withstands high thermal stress and high mechanical stress.

4,388,043

CONDUCTIVITY DEPENDENT PUMP AND PROCESS CONTROL

Gunther W. B. Preiss, Fremont, Calif., assignor to Trevex Corporation, Hayward, Calif.

Filed Dec. 21, 1981, Ser. No. 332,862
Int. Cl.³ F04B *49/06*
U.S. Cl. 417—36 **7 Claims**



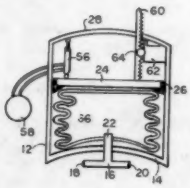
1. A device for activating or inactivating a liquid pump on the basis of the electrical conductivity of a liquid, the device comprising, in combination, a housing having a passageway through which a liquid can flow, a pair of electrodes disposed about the passageway, means for connecting the passageway to a liquid pump and means for connecting the electrodes to a conductivity-dependent pump activation means in communication with the pump, the pair of electrodes comprising a generally tubular outer electrode coaxially disposed about a generally tubular inner electrode, the electrodes being separated by a liquid conductivity measuring chamber, and the inner electrode including an opening for initial liquid contact and an opening adapted to permit liquid communication through the tubular inner electrode and the conductivity measuring chamber.

4,388,044

WATER STORAGE TANK

Paul Wilkinson, Rte. 4, Asheville Hwy., Knoxville, Tenn. 37914

Filed Aug. 1, 1980, Ser. No. 174,614
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—38 **8 Claims**



1. A liquid delivery system for pumping a liquid from a supply source to a storage tank, and continuously maintaining said liquid in said storage tank under pressure within a selected range of pressures comprising:

a storage tank comprising an end wall and side walls defining a liquid storage container, said liquid storage container having a cross-section of a selected shape and selected area extending between a first and farther portion, and a travel axis perpendicular to and extending the length of said selected cross-section, said tank further including liquid receiving and discharging means connected to said end wall;

a plunger having a first side and a second side, and an outside shape corresponding to said selected cross-section for providing a sliding fit of said plunger within said liquid storage container along said travel axis and between said first and farther portions such that said first side contacts said liquid contained therein and encloses said liquid storage container so that the volume of said liquid storage container is reduced as said plunger moves from said first portion to said farther portion, and wherein the area of both said first and second sides of said plunger which is perpendicular to said travel axis is equal to said selected area;

an end member secured to said side walls to provide an air tight seal therebetween such that compressed air between said end member and said second side of said plunger provides a first biasing means for urging said plunger towards said farther portion;

a collapsible liquid impervious liner located within the liquid storage container and connected to said receiving and discharging means such that any liquid provided to said storage tank by said receiving means is contained completely within said liner;

second biasing means for urging said plunger towards said farther portion;

a pump to receive liquid from said supply source, and to force said liquid into said tank through said liquid receiving and discharging means such that said plunger is moved against said first and second biasing means from said farther portion towards said first portion; and

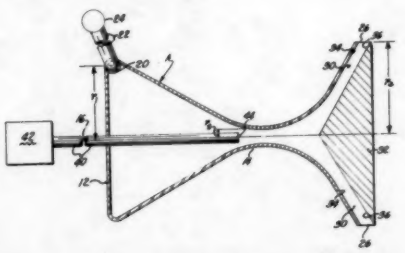
a pressure switch to turn said pump on and off as the pressure of said liquid in said tank varies between said selected range of pressure.

4,388,045

APPARATUS AND METHOD FOR MIXING AND PUMPING FLUIDS

Wayne E. Simon, Evergreen, Colo., assignor to Martin Marietta Corporation, New York, N.Y.

Continuation of Ser. No. 653,931, Jan. 30, 1976, abandoned. This application Apr. 21, 1978, Ser. No. 898,961
Int. Cl.³ F04F *5/42*
U.S. Cl. 417—54 **2 Claims**



1. Apparatus for pumping a fluid at a pressure below ambient pressure, said apparatus comprising an enclosed fluid chamber having a funnel shaped first surface circumscribing a longitudinal axis and converging toward the longitudinal axis from a wide end to a narrow end, a throat comprising a second surface contiguous with said first surface and forming a venturi-like passage circumscribing said longitudinal axis and having a throat inlet disposed in fluid communication with said narrow end of said first surface, said second surface further forming a throat outlet, a diffuser having a diffuser inlet in fluid communication with the throat outlet of said venturi-like throat and a diffuser outlet at ambient pressure, means for introducing a pumping fluid tangentially into said chamber at the wide end

thereof, said chamber and said throat configured to form the pumping fluid into a swirling vortex flow which advances toward said throat along a decreasing radius and at an increasing speed to form a low pressure region therein, low pressure fluid inlet means positioned on said longitudinal axis and in fluid communication with the low pressure region formed by the swirling vortex flow of pumping fluid so that the low pressure fluid is drawn through said low pressure fluid inlet and mixed with the pumping fluid to form a swirling flow of mixed fluid which advances through the venturi-like throat into the diffuser as a swirling flow, said diffuser comprising a first diverging surface contiguous with said second surface of said throat and a diffuser member disposed on said longitudinal axis in the path of the swirling fluid and including a second diverging surface facing and spaced apart from said first diverging surface and forming therewith a conical section for guiding a swirling flow of fluid from the outlet of the throat along a path of increasing radius to compress the mixed fluids to ambient pressure and blocking flow of ambient pressure through the diffuser to the throat.

2. A method of pumping a low pressure fluid at a pressure below ambient pressure including the steps of introducing a pumping fluid tangentially into the wide end of an enclosed funnel-shaped chamber which has a longitudinal axis and converges to a narrow end in fluid communication with a venturi-like throat, forming the pumping fluid into a swirling vortex flow which advances toward the narrow end of the chamber and into the venturi-like throat along a path of decreasing radius and at an increasing speed to form a low pressure region therein, which low pressure is lower than the pressure of the low pressure fluid, positioning a low pressure fluid inlet at the low pressure region of said chamber and located on the longitudinal axis thereof so that the low pressure fluid is drawn into the low pressure region in said swirling vortex flow of pumping fluid and mixed with the pumping fluid to form a swirling flow of mixed fluids which advances as a swirling flow through the venturi-like throat and enters a diffuser as a swirling flow of fluid, guiding the swirling flow in the diffuser along a conical path of increasing radius while resisting flow of ambient pressure through the diffuser to the venturi-like throat to compress the mixed fluids to ambient pressure.

4,388,046

ROTARY COMPRESSORS

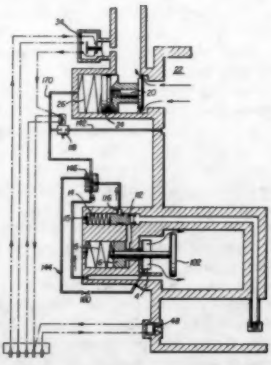
Edward Boller, Halesowen, England, assignor to Hydrovane Compressor Company Limited, Worcestershire, England

Continuation-in-part of Ser. No. 909,683, May 25, 1978, abandoned. This application May 7, 1980, Ser. No. 147,528

Claims priority, application United Kingdom, May 25, 1977, 22080/77; Jan. 9, 1978, 714/78

Int. Cl.³ F04B *49/02, 49/08, 49/10*

U.S. Cl. 417—295 **3 Claims**



1. A rotary compressor of the oil sealed type having an air inlet, an air delivery passage, a delivery space and a compression space, including:

a servo valve;

an unloader valve including a piston and a spring and controlling the air inlet and actuated by said piston subject to a pressure controlled by said servo valve which in turn is acted on by compressor pressure opposing a second spring;

a minimum pressure valve including a third spring controlling the air delivery passage and opened by compressor pressure against said third spring and a restoring pressure;

and venting means arranged to vent the delivery and compression spaces of the compressor and connected to a changeover valve operatively coupled to the pressure in a compressed air supply line to assume an on-load position when the said supply line pressure does not exceed a predetermined value greater than the normal working pressure, and to assume a no-load position when the said supply line pressure exceeds the said predetermined value, in which position it permits the venting means to vent the delivery and compression spaces, the compressor further including pressure sensitive switch means operably connected to said changeover valve so that when compressed air is being accepted by a load the changeover valve is in the on-load position and the servo valve and unloader valve modulate the inlet to maintain the nominal compressor delivery pressure with the venting means inoperative and the minimum pressure valve opened whereas when compressed air is not accepted the change-over valve assumes the no-load position, the minimum pressure valve closes the delivery, the venting means operates to vent the delivery and compression spaces, and the unloader valve opens to increase the compressor pressure when the latter sinks below a predetermined low value.

4,388,047

SOLENOID-OPERATED PUMP

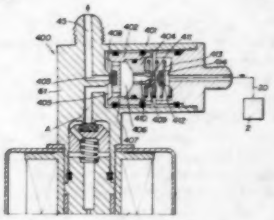
Akira Mizuno, and Shigeo Suzuki, both of Fukuroi, Japan, assignors to Shizuoka Seiki Co., Ltd., Fukuroi, Japan

Filed Dec. 19, 1980, Ser. No. 218,381

Claims priority, application Japan, Dec. 22, 1979, 54-167205

Int. Cl.³ F04B *49/02;* G05D *7/01*

U.S. Cl. 417—299 **15 Claims**



1. A solenoid-operated group, comprising:

a pump body having a first passage extending therethrough, said first passage having a closeable port between the ends thereof;

a solenoid-operated actuator mounted in said pump body for pumping fluid through said first passage, said actuator being located upstream from said port;

fluid directing means comprising a directional control valve mounted on said pump body adjacent to said port, said directional control valve having a valve casing and a valve slide mounted for sliding movement in said valve casing, said valve slide having a first end wall and a second end wall at opposite ends thereof, said first end wall being disposed in opposing relationship to said port, said second end wall being disposed in opposing relationship to

an end wall of said valve casing, a first valve member supported on said first end wall of said valve slide and adapted to seat against and thereby close said port, said fluid directing means having a second passage branched from said first passage at a location upstream of said port, a second valve member in said second passage, said second valve member being mounted on said end wall of said casing, said valve slide having a valve element on said second end wall thereof and disposed in opposing relation to said second valve member and adapted to seat against said second valve member to close said second passage;

means for normally positioning said valve slide in a first position in which said first valve member seats against and closes said port so that said first passage is blocked and said valve element is spaced from said second valve member so that said second passage is open;

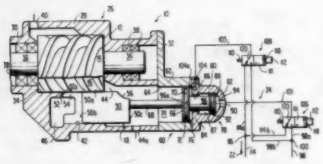
and means in said second passage for producing a change in the pressure of the fluid flowing therethrough in response to a change of the viscosity of the fluid and shifting said valve slide to a second position in which said first valve member is spaced from said port so that said first passage is open and said valve element is seated against said second valve member so that said second passage is blocked.

4,388,048

STEPPING TYPE UNLOADING SYSTEM FOR HELICAL SCREW ROTARY COMPRESSOR

David N. Shaw, Unionville, and Joseph A. L. N. Gagnon, Windsor Locks, both of Conn., assignors to Dunham Bush, Inc., West Hartford, Conn.

Filed Mar. 10, 1981, Ser. No. 242,100
Int. Cl.³ F04B *49/00*; F01C *1/16*
U.S. Cl. 417—310 **4 Claims**



1. A stepping type slide valve unloading system for a positive displacement helical screw rotary compressor, said compressor comprising:

a compressor casing provided with a barrel portion defined by intersecting bores with coplanar axes located between axially spaced end walls and having a low pressure suction port and a high pressure discharge port in communication with said bores at opposite ends of said barrel portion,

helical screw rotors having grooves and lands and being mounted for rotation within respective bores with the lands and grooves of respective rotors intermeshed,

an axially extending recess provided within the barrel portion of the casing and in open communication with said bores,

a slide valve member longitudinally slidable in said recess with the inner face of the slide valve member being complementary to the envelope at that portion of the bores of the casing structure confronted by the opening of the recess communicating with the bore portion of the case,

said slide valve member being in sealing relation with the confronting rotors,

at least a portion of the discharge port being located within the barrel portion of the casing with the slide valve member being movable between extreme positions with the end of the slide valve member proximate to the suction port variably closing off a portion of the recess in open communication with the suction port and functioning as a bypass for a gaseous working fluid,

a linear drive motor for said slide valve member,

said motor comprising a cylinder, a main drive piston sealably and slidably positioned within said cylinder and a piston rod connecting said piston to said slide valve member, said piston forming with said cylinder an inboard chamber on the side of said piston proximate to said slide valve member, and an outboard chamber on the opposite side thereof, and

means for supplying and relieving hydraulic fluid pressure to at least one of said chambers for shifting said slide valve member between extreme positions,

the improvement comprising:

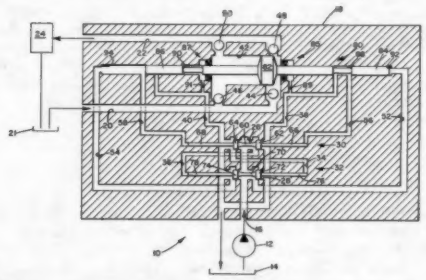
a stepping piston carried by said linear motor and including a portion shiftable between retracted and projected positions into and out of one of said chambers to physically abut said main drive piston and to stop said main drive piston at an intermediate position between the slide valve member extreme positions to thereby define with the main drive piston of said linear motor, three distinct capacity control step positions for said slide valve member.

4,388,049

FLUID SUPPLY SYSTEM USING ONE FLUID MEDIUM TO MOVE A SECOND FLUID MEDIUM

Ronnie F. Burk, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 29, 1980, Ser. No. 191,964
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—396 **4 Claims**



1. A secondary fluid supply system connectible to a source of primary fluid, a first fluid reservoir of primary fluid, a second fluid reservoir of secondary fluid, and a secondary fluid function, said secondary fluid supply system comprising:

(a) a pump body;

(b) a main bore enclosed within said pump body having respective first and second ends;

(c) first and second bores enclosed within said pump body having respective first and second ends;

(d) an inlet into said pump body connecting said source of primary fluid to said first and second bores between said respective first and second ends thereof;

(e) first and second pilot passages enclosed within said pump body respectively connecting said first bore proximate said first end to said second end of said second bore, and said first bore proximate said second end to said first end of said second bore;

(f) first and second main passages enclosed within said pump body respectively connecting said second bore proximate said first end to said first end of said main bore, and connecting said second bore proximate said second end to said second end of said main bore;

(g) first and second control passages enclosed within said pump body respectively connecting said first and second

ends of said first bore to said first and second main passages approximately at said ends of said main bore;

(h) first and second relief passages enclosed within said pump body respectively connecting said first ends of said first and second bores to said first main passage between said first control passage and said first end of said main bore and said second ends of said first and second bores to said second main passage between said second control passage and said second end of said main bore;

(i) a secondary fluid reservoir passage enclosed within said pump body connecting said second fluid reservoir to both said first and second ends of said main bore;

(j) a secondary fluid passage enclosed within said pump body connecting said secondary fluid pressure function to both said first and second ends of said main bore;

(k) first and second reservoir check valves respectively disposed in said reservoir passage proximate said first and second ends of said main bore for preventing secondary fluid from flowing from said main bore into said reservoir passage;

(l) third and fourth check valves respectively disposed in said secondary fluid pressure function passage proximate said first and second ends of said main bore for preventing secondary fluid from flowing from said secondary fluid pressure function into said main bore;

(m) a first spool valve positioned within said first bore and extending into both said first and second control passages, said first spool valve being movable in response to primary fluid in said second control passage to connect said primary fluid from said source to said second pilot passage and said second relief passage to said first pilot passage and in said first control passage to connect said primary fluid from said source to said first pilot passage and said second relief passage to said second pilot passage;

(n) a second spool valve positioned within said second bore and extending into both said first and second pilot passages, said second spool valve being movable in response to primary fluid in said second pilot passage to connect said source to said first main passage and said second relief passage to said second main passage and to primary fluid in said first pilot passage to connect said source to said second main passage and said first relief passage to said first main passage; and

(o) a free piston positioned within said main bore and extending into said first and second main passages, said free piston responding to pressurized primary fluid present in said first main passage to move from a first position connecting said first and second control passages to said first fluid reservoir and said second bore through a series of positions drawing fluid from said reservoir through said first reservoir check valve and supplying fluid from said main bore through said second outlet check valve while respectively blocking said first and second control passages from said first and second main passages to a second position respectively connecting said first and second control passages to said second bore and to said first fluid reservoir, said free piston responsive to primary fluid in said second main passage to move from said second position through a series of positions drawing fluid from said reservoir through said second reservoir check valve and supplying fluid from said main bore through said first outlet check valve to said first position.

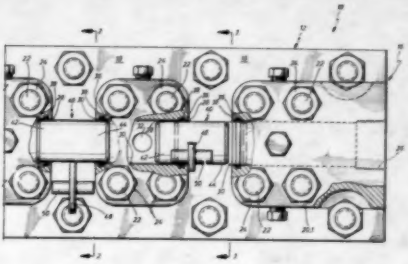
4,388,050

MANIFOLD UNIT AND ASSEMBLY AND FLUID END ASSEMBLY

Ronald A. Schuller, Tulsa, Okla., assignor to Geosource, Inc., Houston, Tex.

Filed Mar. 27, 1981, Ser. No. 248,494
Int. Cl.³ F04B *1/00*
U.S. Cl. 417—454 **18 Claims**

1. A suction manifold unit for mounting relatively to a pump fluid end in association with at least one further suction manifold unit to provide a suction manifold assembly for supplying fluid to suction cylinders of such a pump fluid end, the manifold unit having at least one supply duct leading to its interior, an outlet duct for leading fluid from the supply duct to a suction cylinder during use, and a supply conduit sealingly associated with the supply duct, the supply conduit being adjustable



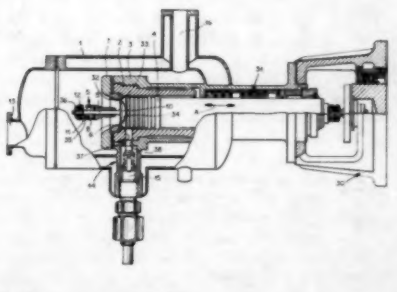
between a retracted position where it would be spaced from another manifold unit mounted relatively to such a pump fluid end, and an extended position for engaging sealingly with a corresponding supply duct of such a further manifold unit to place the manifold units in communication.

4,388,051

PISTON PUMP WITH INTAKE VALVE

Helmut Dresler, Trostberg, and Ernst Turnwald, Altenmarkt, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,169
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005608
Int. Cl.³ F04B *7/00, 15/08*
U.S. Cl. 417—505 **5 Claims**



1. A piston pump comprising:

a cylinder;

a pumping piston member reciprocatable in said cylinder and having an intake stroke upon movement in one direction and a discharge stroke upon movement in the opposite direction;

an intake port formed in said cylinder and provided with an intake valve having

an intake valve member approached by said piston at the end of a discharge stroke, and

a spring biasing said valve member into a closed position,

a discharge port provided with a discharge valve whereby fluid is displaced from said cylinder through said discharge port during said discharge stroke; and

magnetic means providing a magnetic force between said intake valve member and said pumping piston member counter to the force of said spring only upon approach by said piston to said intake valve member at the end of a discharge stroke, thereby attracting said intake valve

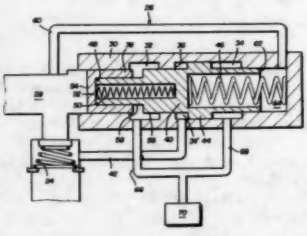
member to open said intake valve temporarily by the magnetic force upon the inception of the intake stroke.

4,388,052

FIXED DISPLACEMENT PUMP WITH VARIABLE CAPACITANCE FLOW REGULATOR

Eugene L. Falendysz, Sr.; Eldon M. Brumbaugh, and Max R. North, all of Racine, Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 26, 1981, Ser. No. 247,667
Int. Cl.³ F04B *39/00, 23/00;* F16L *55/04*
U.S. Cl. 417—540 3 Claims



1. In a fixed displacement fluid pump which is adapted for connection to a hydraulic circuit for supplying the fluid under pressure required by the hydraulic circuit and said pump having a fluid discharge chamber that is connected to said hydraulic circuit by a valve means, the improvement comprising:

a variable capacitance flow regulator connected to said fluid discharge chamber for absorbing the excess fluid flow from said pump which is not required by said hydraulic circuit, said variable capacitance flow regulator including a housing, a first piston slidably mounted within said housing for movement in response to variations in the fluid pressure in said hydraulic circuit and a first spring means mounted between one end of said housing and one end of said first piston, and means for communicating the fluid pressure from downstream of said valve means to said first piston for biasing said first piston against said first spring means to various positions within said housing depending upon the fluid pressure in said hydraulic circuit,

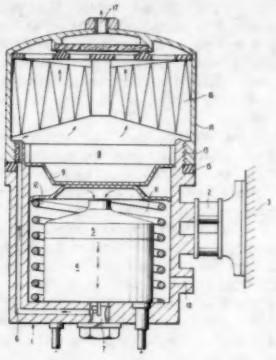
a second variable capacitance piston slidably mounted within said housing for independent movement relative to said first piston and a second spring means mounted between said first and second pistons, means for communicating the fluid pressure from said pump discharge chamber aganist one end of said second piston for biasing it against said second spring means and means for communicating the fluid pressure from said pump discharge chamber to said one end of said first piston, and said second piston being movable toward and away from said first piston depending upon the fluid flow demands of said hydraulic circuit and the fluid flow in said pump discharge chamber, thereby absorbing the fluid displacement from said pump which is not required by said hydraulic circuit.

4,388,053

FUEL FEED PUMP

Günter Bartel, Stuttgart; Eckhard Patz, Waiblingen; Karl Koch, Fellbach; Georg Stern, Sindelfingen; Manfred Stotz, Aichwald, and Adolf Triffterer, Nuertingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 9, 1981, Ser. No. 232,815
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1980, 3004458
Int. Cl.³ F04B *11/00*
U.S. Cl. 417—542 13 Claims



1. A fuel feed pump arrangement adapted to be connected to a fuel conduit system, the fuel feed pump arrangement comprising an electric drive motor means, a fuel pump system coupled to the drive motor means, and a common housing means for accommodating both the drive motor means and the fuel pump system, a diaphragm means disposed in the housing means for maintaining a pressure in the fuel conduit system for a predetermined period of time after the drive motor of the pump system has been turned off,

the diaphragm means dividing the housing means into a pressure chamber and a vacuum chamber, the electric drive motor means and feed pump system disposed in the vacuum chamber, means for supplying a pressure to the pressure chamber so as to expose the diaphragm means to the pressure,

a spring means disposed in the vacuum chamber, a diaphragm means pressing against the spring means when exposed to the pressure in the pressure chamber,

the spring means comprises a coil spring which surrounds the electric drive motor means and the feed pump system.

4,388,054

METHOD FOR MANUFACTURING ELONGATED BODIES BY EXTRUSION OF POWDER IN A CAPSULE

Hans-Gunnar Larsson, Västeras, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden

Filed Apr. 20, 1981, Ser. No. 255,732
Claims priority, application Sweden, Apr. 25, 1980, 8003139
Int. Cl.³ B22F *5/00;* F16H *7/00*
U.S. Cl. 419—32 11 Claims

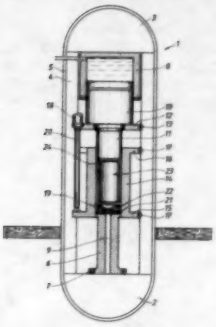
1. A method of manufacturing an elongated, dense metallic body by extrusion of a powder charge enclosed in a metal capsule, which method comprises

(a) heating the powder charge in its metal capsule to a temperature sufficient to cause bonding of the charge at the pressure applied in step (d) to achieve extrusion;

(b) inserting the capsule containing the heated powder charge into a pressure cylinder which has positioned at one end thereof a die having an opening therethrough;

(c) surrounding the capsule in the pressure cylinder with a

thermally insulating layer of a readily deformable material, the readily deformable material being selected from the group consisting of talcum powder and pyrophyllite powder, and



(d) applying a pressure to the capsule and the readily deformable material in the pressure cylinder so as to cause the capsule and the deformable material therearound to be extruded together through the opening in the die.

4,388,055

MAT-FORMING APPARATUS

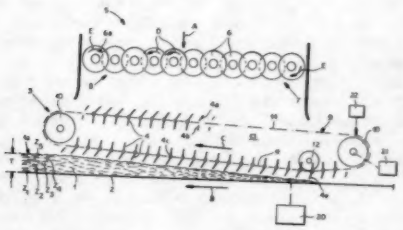
Werner Ufermann, Bernried, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Jun. 11, 1981, Ser. No. 272,473

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 3022629; Jun. 18, 1980, 3022707

Int. Cl.³ B29J 5/00

U.S. Cl. 425—80.1 **6 Claims**



1. An apparatus for forming a layer of transversely oriented particles, especially for the production of particle board, said apparatus comprising:

a continuously movable layer-receiving surface;

a pair of roller members spaced apart along said surface in the direction of movement thereof;

an endless traveling grate disposed above said surface and looped around said roller members said traveling grate having a lower pass moving generally in the direction of movement of said surface, said traveling grate having flights extending transverse to the direction of movement of said surface and adapted to orient particles deposited thereon, said flights being spaced apart in said direction whereby particles can fall through the passes of said grate between said roller members, said flights having lower edges which define an inclined plane path along a lower pass of said traveling grate diverging from said surface in the direction of movement of said lower pass; and

a dispenser for said particles disposed above said traveling grate and substantially extending over the length thereof for depositing particles on said surface through the upper and lower passes of said traveling grate between said roller members.

4,388,056

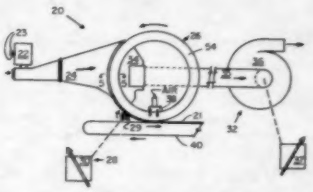
APPARATUS FOR CONTINUOUSLY MAKING AN AIR-LAID FIBROUS WEB HAVING PATTERNED BASIS WEIGHT DISTRIBUTION

Franky B. Lee, and Orin Jobes, Jr., both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 280,768, Jul. 6, 1981, abandoned, which is a continuation of Ser. No. 176,370, Aug. 8, 1980, abandoned. This application Jul. 6, 1982, Ser. No. 395,445

Int. Cl.³ B29J 1/00

U.S. Cl. 425—83.1 **10 Claims**



1. In an improved apparatus for continuously forming an air-laid fibrous web having oppositely phased, cyclically undulating side edges and a predetermined patterned basis weight distribution which apparatus includes a laydown drum having a forming surface, means for forming and directing a column of air entrained fibers onto said forming surface and depositing fibers on said forming surface, and air flow inducing means for drawing fiber-depleted air through said surface and exhausting it, said laydown drum having a circumferentially segmented annular-shape plenum comprising a multiplicity of circumferentially spaced transverse plenum segments, a partially masked foraminous laydown surface having oppositely contoured, cyclically undulating side edges defining cyclically circumferentialiy alternately spaced relatively widely masked and relatively narrowly masked sections of said surface and which sections corporately define the radially outwardly facing boundary of said plenum, and said air flow inducing means including constant differential pressure means for drawing air through said surface and said plenum from an air-entrained-fiber deposition chute as said drum is being rotated on its axis of revolution, the improvement comprising stationary adjustable air flow modulating means disposed adjacent the radially inwardly disposed boundary of an arcuate portion of said plenum circumferentially spanning a plurality of said transverse plenum segments so that the pressure drop induced by said means for drawing air through said surface can be adjusted across said relatively widely masked transverse sections of said lay-down surface without substantially affecting the pressure drop induced across said relatively narrowly masked transverse sections of said lay-down surface.

4,388,057

DEVICE FOR THE CONTINUOUS APPLICATION OF LIQUID FINISH TO A SPINNERET

Adolf Bachmann, Heimbuchenthal; Joachim Boehler, Grosswallstadt, and Heinz Linhart, Erlenbach, all of Fed. Rep. of Germany, assignors to Akzona, Incorporated, Asheville, N.C.

Division of Ser. No. 144,278, Apr. 28, 1980, Pat. No. 4,301,101. This application Jul. 2, 1981, Ser. No. 279,846

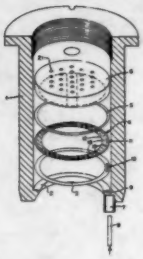
Claims priority, application Fed. Rep. of Germany, May 14, 1979, 2919331

Int. Cl.³ A01J 21/00

U.S. Cl. 425—97 **14 Claims**

1. In combination, a spinneret having an exit face provided with a plurality of spinning orifices arranged in a pattern,

through which polymeric filaments are melt extruded, and a device for effecting continuous application of a liquid finish to the exit face of the spinneret from which the filaments are extruded, said device including a removable and reinstallable distribution element having at least one opening corresponding to the pattern of the spinning orifices and means for directing



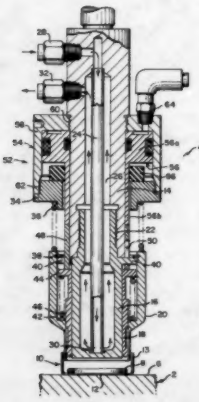
the liquid finish around said at least one opening in said distribution element and for distributing the liquid finish onto said exit face, and fastening means for fitting the distribution element subjacent to the exit face of the spinneret, said fastening means having an opening to supply the finish to the distribution element.

4,388,058

MOLDING DEVICE FOR FORMING A LINER INSIDE OF A CLOSURE SHELL

Tateo Kubo, Hiratsukashi, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,641
Claims priority, application Japan, Mar. 21, 1980, 55-34685
Int. Cl.³ B29C *1/04, 3/00, 6/00*
U.S. Cl. 425—110 **5 Claims**



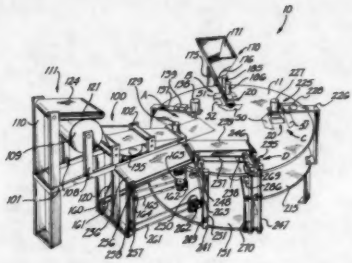
1. A molding device for forming a liner on an inside surface of a top panel of a closure shell where the inside surface includes a central portion comprising an anvil adapted to support an inverted closure shell having a liner material on the inside surface, a molding tool disposed above the anvil including a main body having a lower end portion, a center punch having a lower surface fixed to the lower end portion with the lower surface of the center punch adapted to be positioned opposite to a central portion of the inside top panel surface of a shell supported on the anvil, an annular bushing positioned externally of the center punch, and an elevator mechanism for moving the main body with respect to the anvil; characterized in that the annular bushing is movable with respect to said main body, in having a first resilient means for urging the annular bushing upwardly relative to said main body, and in having a lowering mechanism for selectively lowering the annular bushing against the force of said resilient means.

4,388,059

AUTOMATIC EGG ROLL MAKING MACHINE

Kwok C. Ma, 144 Hester St., New York, N.Y. 10013

Filed Nov. 30, 1981, Ser. No. 325,792
Int. Cl.³ B29D *3/00*; A23P *1/00*
U.S. Cl. 425—112 **13 Claims**



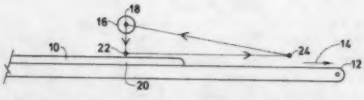
1. Apparatus for automatically making egg rolls comprising:
intermittently moving rotary table transmitting means;
a plurality of forming assemblies on the transmitting means, each forming assembly comprising folding means for folding three side portions of an egg roll dough and mold means for receiving a part of the egg roll stuffing therein;
feeding means for feeding the egg roll dough successively on each forming assembly;
supply means for supplying the egg roll stuffing on the egg roll dough, said supplying means preparing the necessary amount of the stuffing to be disposed in one egg roll product and putting the stuffing into the mold means to deposit the stuffing and a part of the egg roll dough therein;
actuating means for actuating the folding means of said forming assembly to fold three side portions of the egg roll dough over the stuffing in the mold means to thereby form a partially folded egg roll; and
wrapping means for wrapping the partially folded egg roll to form a cylindrical product, said means for wrapping including means for pushing up the partially folded egg roll from the mold, means for turning the partially folded egg roll for wrapping the remaining side portion of the egg roll thereon and means for transferring the wrapped product.

4,388,060

DOUGH ROLLING APPARATUS

Victor F. Gugler, Pinewood Springs, Lyons, Colo. 80540, assignor to Victor Gugler, Lyons, Colo.

Filed Dec. 7, 1981, Ser. No. 328,234
Int. Cl.³ B29C *15/00*; A21C *3/02*
U.S. Cl. 425—150 **18 Claims**



1. Dough rolling apparatus comprising:

means for moving a sheet of dough horizontally in a forward direction;

a roller;

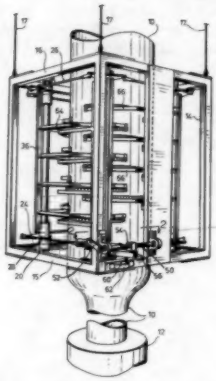
and means for moving said roller from a first position, spaced above a portion of said sheet, generally downwardly into a second position such that said roller is pressed into said sheet as said sheet is moving in said forward direction, said roller being movable in said forward direction a selected distance to a third position with said roller rotating to roll out and thin said dough when both said sheet and said roller are moving between said second and third positions, and then returning said roller to said first position, said roller being mounted for generally horizontal movement along a framework which has means to support said roller and which support means enables said roller to be oscillated generally vertically with respect to said sheet under operation of a connected actuating means which effects said oscillation.

4,388,061

GUIDE ASSEMBLY FOR CYLINDRICAL PLASTIC TUBES

Janos B. Bebok, Mississauga, Canada, assignor to Macro Engineering Company Ltd., Mississauga, Canada

Filed Jul. 17, 1981, Ser. No. 284,170
Int. Cl.³ B29D 7/22
U.S. Cl. 425—392 **10 Claims**



1. A guide assembly for the guidance of a cylindrical tube of plastic material in its travel path from a forming die comprising:

a longitudinal support frame adapted to extend along the portion of the travel path in which guidance is to be provided;

a plurality of pairs of longitudinal members mounted by the frame circumferentially spaced around the said travel path for rotational movement about respective longitudinal axes parallel to one another and to the said travel path portion;

means for moving the two longitudinal members of each pair simultaneously in opposite directions of rotation about their respective longitudinal axes;

each longitudianl member carrying a plurality of longitudinally-spaced, parallel radially-extending arms, each arm of one longitudinal member being associated with a cooperating arm of the other longitudinal member of the said pair thereof;

each two cooperating arms having connected thereto at respective connection positions a respective guide member that is transversely flexible along its length between said connection positions to permit change of curvature thereof, and adapted for guiding engagement with the external surface of a tube in the travel path and for change of its curvature to conform with the diameter thereof;

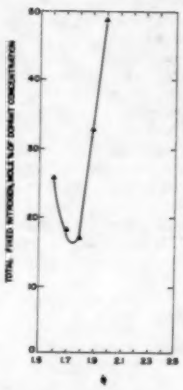
said simultaneous opposite rotational movement of the two members of each pair causing corresponding inward or outward movement of the said arm connection positions respectively toward or away from the travel path to permit the guide member to change its curvature and thereby conform respectively to tubes of smaller or larger diameter.

4,388,062

MULTI-STAGE PROCESS FOR COMBUSTING FUELS CONTAINING FIXED-NITROGEN SPECIES

William Bartok, Westfield; Yih H. Song, Berkeley Heights; Vince J. Siminski, Rockaway, all of N.J., and John P. Longwell, Cambridge, Mass., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 178,328, Aug. 15, 1980, abandoned. This application Dec. 22, 1980, Ser. No. 218,631
Int. Cl.³ F23M 3/04
U.S. Cl. 431—10 **14 Claims**



1. A process for converting fixed nitrogen into molecular nitrogen in a multistage combustion process comprising:

(a) mixing a fuel with at least one first oxidizing agent in amounts such that the equivalence ratio of said fuel to said first oxidizing agent is at least about 1.4;

(b) partially combusting the mixture resulting from step (a) in at least one first stage at a first temperature of about 1803° to 1950° K., with a residence time of at least 0.03 second to less than 0.4 second;

(c) injecting a free radical agent into the partially combusted mixture of said fuel and said first oxidizing agent;

(d) reacting the mixture of said free radical agent and said partially combusted mixture of said fuel and said first oxidizing agent for at least about 0.05 second to about 0.2 second;

(e) mixing the reaction products resulting from step (d) with at least one second oxidizing agent in an amount such that the equivalence ratio of reaction products to the total amount of oxidizing agents in the mixture will be about 1.0 or less, such mixing taking place under conditions such that the temperature of the mixture will not exceed about 1800° K.; and

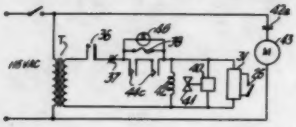
(f) completely combusting the mixture resulting from step (e) in at least one second stage at a second temperature of about 1200° K. to less than about 1800° K.

4,388,063

COMBUSTION HEATING SYSTEM

Laurence B. Craig, 116 Duck Pond Rd., Glen Cove, N.Y. 11542, and Alfred J. Farina, 1939 Anita Ct., Baldwin, N.Y. 11510

Filed Oct. 16, 1980, Ser. No. 197,571
Int. Cl.³ F23N 5/00
U.S. Cl. 431—19 3 Claims



1. In a heat generation and transfer device having a reactor for generating heat from the combustion of a fuel, a casing surrounding the reactor to define a combustion chamber, and an operational circuit including means for igniting a gaseous fuel fed under an initial low pressure sufficient for flowing the fuel through the reactor to the combustion chamber in which the fuel expands during combustion and exhibits an increased higher operational pressure, the safety improvement comprising:

switch contacts normally held open by spring urgency and closed in response to an overriding pressure, which when closed complete an operational circuit for the continued combustion of fuel within the chamber,

a sensor responsive to said higher operating pressure of said combusted gaseous fuel within the combustion chamber to cause said normally open switch contacts to close in response thereto, and

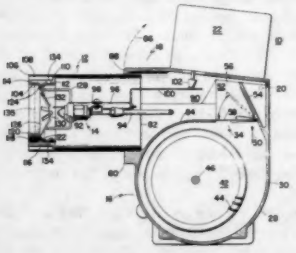
delayed reaction fuse means electrically connected across said normally open switch contacts to provide an alternate path for completion of said operational circuit, the normal operating current for the operating circuit being sufficient to cause said fuse means to open after a predetermined time, said predetermined time being greater than the time required to initiate combustion and provide said overriding pressure.

4,388,064

ENERGY EFFICIENT HIGH STATIC PRESSURE FLUID FUEL BURNER

Robert A. Kaplan, and James E. Wellman, both of Fort Wayne, Ind., assignors to The Scott & Fetzer Company, Fort Wayne, Ind.

Filed Aug. 11, 1980, Ser. No. 176,973
Int. Cl.³ F23Q 3/00
U.S. Cl. 431—265 9 Claims



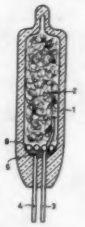
1. In a gun-type fluid fuel burner having a blast tube with a fuel dispensing nozzle therein: a blower housing having a scroll side wall and opposite end walls, said side wall having an upwardly facing air discharge opening therein communicating with said blast tube and one of said end walls having an air inlet opening therein; a blower wheel mounted for rotation in said housing for drawing air through said inlet opening and discharging the same under pressure through said discharge opening; a damper plate mounted on said housing for movement between an open position and a position closing said discharge opening, said damper being moved to said open position thereof in response to movement of air by said blower and returning to said closed position under the influence of biasing force; and means for selectively adjusting said open position of said damper; said blast tube having inner and outer ends, said housing including a first yoke portion adapted to receive and support a part of said inner end of said blast tube, and further comprising a cover member pivotally connected to said housing end walls at a point spaced from said blast tube inner end for movement between open and closed positions, said housing side wall having an outer surface extending between said air discharge opening and said first yoke portion, said cover member having a second yoke portion complementing said first yoke portion and adpated in said closed position of said cover member in conjunction with said first yoke portion to embrace said inner end of said blast tube, said cover member in said closed position thereof defining with said outer surface of said side wall an air passage communicating between said air discharge opening and said inner end of said blast tube.

4,388,065

COMBUSTION FLASH BULB

Karlo P. Martens, Terneuzen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,714
Claims priority, application Netherlands, May 4, 1979, 7903500
Int. Cl.³ F21K 5/02
U.S. Cl. 431—362 9 Claims



1. A combustion flash bulb for high-voltage ignition having a light-pervious envelope in which a mass of actinically combustible metal strips and an oxidizing gas are present and in which current conductors are led through the wall of the envelope in a vacuum-tight manner and are interconnected inside the envelope by an ignition mass, a first of said current conductors extending through the ignition mass into the mass of metal strips, characterized in that a porous mass of an electrically insulating material is provided between the second current conductor and the mass of metal strips.

4,388,066

RADIATION SHIELD AND METHOD OF USE

Cuddalore P. Natarajan, and Siegfried R. Meder, both of Pittsburgh, Pa., assignors to American Schack Company, Inc., Wexford, Pa.

Filed Jul. 31, 1981, Ser. No. 289,100
Int. Cl.³ F27D 7/00; F24J 3/00; F22B 7/04
U.S. Cl. 432—1 19 Claims

1. In a heater, the combination comprising,

a heating chamber including inner and outer heating zones, each of said heating zones being separately fired to a preselected temperature,

said heating chamber having a wall with an inlet and an outlet extending therethrough,

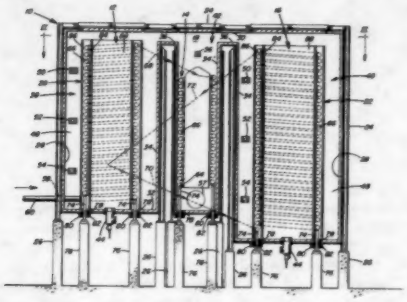
conduit means positioned in a preselected arrangement within said heating chamber for conveying a medium from said inlet through said heating chamber to said outlet,

said conduit means includes a first pipe section connected to said inlet and a second pipe section connected to said outlet,

a coiled pipe section connecting said first pipe section to said second pipe section,

said coiled pipe section forming said inner heating zone and said outer heating zone,

first burner means for supplying heat to said inner heating zone,



second burner means for supplying heat to said outer heating zone,

a pair of radiation shields being positioned adjacent said conduit means in said inner heating zone between said first burner means and said coiled pipe section and in said outer heating zone between said second burner means and said coiled pipe section respectively to lessen the radiant heat transferred to said coiled pipe section from said first and second burner means,

said radiation shields being supported in said heating chamber in spaced relation to said conduit means, and

said radiation shields forming a heat transfer barrier between the source of heat in said heating chamber and said conduit means to reduce the heat transferred to the conduit means for heating the medium.

4,388,067

METHOD AND APPARATUS FOR OPERATING A KILN PLANT WITH SOLID FUEL FIRING IN THE PRECALCINING ZONE

Soren B. Christiansen, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

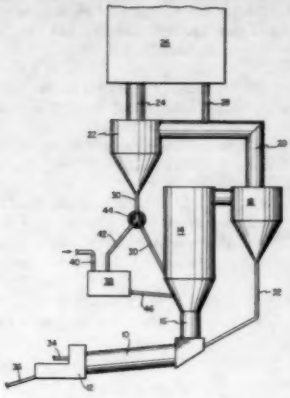
Filed Dec. 10, 1980, Ser. No. 214,976

Claims priority, application United Kingdom, Dec. 11, 1979, 7942684

Int. Cl.³ F27B *15/00*

U.S. Cl. 432—14 **11 Claims**

1. A method of firing with generally solid fuel in a precalcining zone of a kiln plant for burning pulverous or granular material, the kiln plant including at least one preheater for preheating raw material, comprising mixing the generally solid fuel, with at least a portion of the preheated raw material supplied to the precalcining zone, grinding the generally solid fuel together with said portion of preheated raw material, and



feeding the ground mixture of generally solid fuel and preheated raw material to the precalcining zone.

4,388,068

METAL HEATING FURNACE

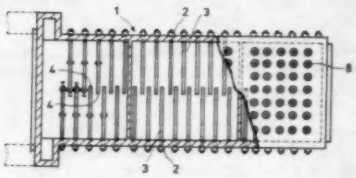
Osamu Takeuchi, Mitaka; Hiroshi Hasegawa, Yokohama; Susumu Izumi, Tokyo, and Naoki Otsuki, Himeji, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Nippon Steel Corporation, both of Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,547

Claims priority, application Japan, Aug. 6, 1980, 55-107969

Int. Cl.³ F27B *9/14*; F26B *5/14*; F24C *3/00*

U.S. Cl. 432—122 **6 Claims**



1. A metal heating furnace comprising:

(a). a substantially closed chamber having side walls, a top, a bottom, an entrance end, an exit end, a horizontal walking beam intermediate the top and bottom and extending from the entrance end to the exit end, and

(b). means for heating a work piece on the walking beam comprising:

i. a plurality of substantially horizontal radiant heating tubes extending from each side wall and spaced along the length of the chamber and adjacent the walking beam and each having an open end adjacent the longitudinal center line of the chamber, and

ii. means at the side wall end of each tube closing that end of the tube, said means being constructed, adapted and operable to discharge fuel and air into the connected tube for combustion within the tube.

4,388,069

DENTAL RESTORATIVE MATERIAL

Jan A. Orlowski, Altadena, Calif., assignor to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Filed Apr. 15, 1982, Ser. No. 368,743
Int. Cl.³ A61K *6/08*
U.S. Cl. 433—228 **7 Claims**

1. Dental restoring material containing at least one polymerizable (meth)acrylic compound and 60 to 90% by weight of the total composition of filler mixture of inorganic filler compounds, the filler mixture consisting essentially of

(a) 50 to 90% by weight, of the filler mixture, of an amorphous filling material,

(b) 10 to 50% by weight, of the filler mixture, of crystalline aluminum silicate, crystalline calcium silicate or a mixture thereof with both crystalline compounds having an average particle size from about 0.3 to 20 microns,

and

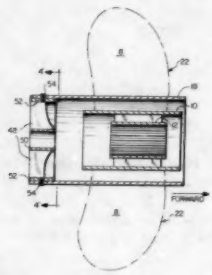
(c) up to 10% by weight, of the filler mixture, of a microfiller with an average particle size of not more than 200 millimicrons.

4,388,070

PROPELLER EXHAUST HUB AND SHROUD

Kenneth Kasschau, 17620 Garrett Dr., Gaithersburg, Md. 20760

Filed Dec. 20, 1978, Ser. No. 971,551
Int. Cl.³ B63H *1/20*
U.S. Cl. 440—89 **4 Claims**



1. A propeller for a through-hub exhaust marine propulsion device, comprising: a hub having a passageway through which exhaust gases flow to rearward, at least one propeller blade, and an annular shroud means extending rearwardly past the after termination of the hub and forward to the forward edge of said blade and fixed concentrically around said hub and open on each end, and means for preventing discharge of exhaust gas through the rearward opening of said shroud means when the said propeller operating in the reverse mode, comprising inducer means for positively inducing the flow of ambient water into said shroud through the rearward opening when the propeller is operating in the reverse mode.

4,388,071

GUM APPLYING APPARATUS

John Sullivan, San Jose, and Harold R. Lillibridge, Burlingame, both of Calif., assignors to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 129,399, Mar. 20, 1980, abandoned.
This application Nov. 24, 1981, Ser. No. 324,613
Int. Cl.³ B31B *1/62*
U.S. Cl. 493—333 **6 Claims**

1. Gum applying apparatus comprising:

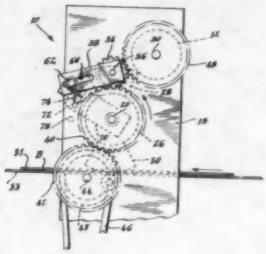
a pair of laterally spaced gum applying dies, each die including

a central circular plate and a pair of circular sectors spaced from each other about the circumference of said circular plate,

shaft means fixed to and between said circular plates for rotating said plates and die sectors,

gummer roll means positioned in the path of rotation of said sectors on each gummer die for contact therewith to effect transfer of gum from said gummer roll means to said die sectors,

gum container means in the path of rotation of said gummer roll means, and



drive means operatively connected to said shaft means and gummer roll means for rotating said shaft means and gummer roll means,

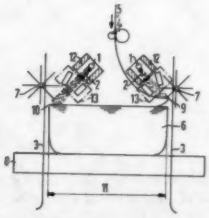
said drive means including means for adjusting the relative distance of said shaft means to said gummer roll means in order to vary the amount of contact pressure of said die sectors with said gummer roll means and thereby, the amount of gum transferred from said gummer roll means to said die sectors.

4,388,072

DEPOSITING DEVICE FOR A PRE-FOLDED CONTINUOUS WEB OF PAPER IN A PAPER STACKER

Gerhard Mueller, Taufkirchen, and Ernst Puritscher, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 4, 1981, Ser. No. 289,881
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1980, 3031309
Int. Cl.³ B65H *45/20*
U.S. Cl. 493—410 **5 Claims**



1. A stacker assembly for piling a prefolded continuous web of paper sheets comprising a surface onto which said sheets are piled, means for directing said sheets in consecutive fashion downwardly into said stack such that opposed folded edges of each sheet lie laterally over said surface, an air jet means for directing a pressurized air stream against at least one folded edge of the uppermost piled sheet to press said folded edge down onto the pile, a moveable directional control means for adjusting the direction of said air stream, in order to accommodate sheets of different form lengths and at least one guide wall means adjacent one folded edge side of the pile, said guide wall

means being laterally displaceable to accommodate sheets of different form lengths and a coupling means for automatically moving said directional control means responsive to displacement of said guide wall means.

4,388,073

DEVICE FOR PIVOTING THE KNIFE IN ITS LONGITUDINAL AXIS AND FOR ADJUSTING THE KNIFE DEPTH ON KNIFE FOLDING MACHINES

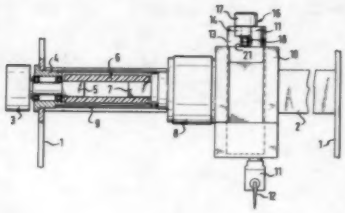
Emil Klenk, Oppenweiler, Fed. Rep. of Germany, assignor to Maschinenbau Oppenweiler Binder GmbH & Co., Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 273,002

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1980, 3027342

Int. Cl.³ B65H *45/18*

U.S. Cl. 493—444 3 Claims



1. In knife folding machines having a coupling and brake unit disposed between and drivingly connecting a rotatable motor drive shaft and a knife drive, for the upwards and downwards movement of a knife bar guided in a housing and carrying an elongated folding knife which cooperates with additional folding elements to produce a folding action, said housing being pivotable about the axis of rotation of the drive shaft, said knife drive being mounted as a unit in said housing to move said knife, a device for pivoting the knife about its longitudinal axis and for adjusting the position of the knife relative to the cooperating folding elements, said position adjusting farther characterised in that there is between said drive shaft and the coupling-brake unit mounted on the housing an elastically deformable rotary joint drivingly connecting the drive shaft to the coupling and brake unit and in that a substantially vertically extending guide plate is arranged to be rigid with a machine frame and in that for pivoting the knife there is at a bottom end of the housing a stay bolt, the length of which is adjustable to vary the space between the housing and guide plate, whereby there is in an upper part of the housing on the guide plate side and parallel with the drive shaft axis, a horizontal pivot arbor which serves as a pivoting axis and in that to adjust the knife position a substantially vertically disposed setscrew is provided which is in screwthreaded engagement with the pivot arbor and its head is rotatably held in a substantially horizontal guide flange in the guide plate and in that at least one locking screw is provided to fix the adjusted vertical knife position, the locking screw being in screwthreaded engagement with the knife bar and having its head resting on the guide plate.

4,388,074

WINGED CATHETER PLACEMENT ASSEMBLY

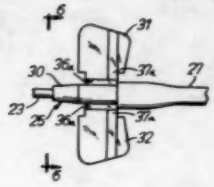
Charles H. Seberg, Libertyville, and Jack L. Harms, Mundelein, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 31,370, Apr. 19, 1979, Pat. No. 4,300,553. This application Jun. 23, 1981, Ser. No. 276,561

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—165 3 Claims



1. An intravenous catheter assembly comprising:

(a) a flexible plastic catheter having a distally tapered distal end;

(b) a winged catheter insertion means comprising a tubular body having a lumen therethrough and a pair of wings having substantially uniform thickness extending oppositely therefrom, the proximal end of said catheter in communication with said lumen of said catheter insertion means via its distal end;

(c) an area of reduced thickness on each of said wings along at least a portion of the width thereof substantially adjacent to said tubular body and providing improved flexibility to said wings;

(d) a needle unit inserted through said catheter and said winged catheter insertion means, said needle unit comprising a needle having a sharpened distal end extending beyond said distal end of said catheter;

(e) said lumen of said winged catheter insertion means having a diameter predetermined to only capture said needle within said tubular body by the distortion of said lumen of said winged catheter insertion means when said wings are simultaneously held in a substantially vertical position; and

(f) a raised portion transverse to said tubular body on each of said wings constructed and arranged to exert pressure on said tubular body so as to distort the lumen thereof when said wings are simultaneously held in a substantially vertical position.

4,388,075

DISPOSABLE DIAPER WITH WIDE ELASTIC GATHERING MEANS FOR IMPROVED COMFORT

Frederick K. Mesek, and Virginia R. Mesek, both of Oak Forest, Ill., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J. and Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Continuation-in-part of Ser. No. 1,616, Jan. 8, 1979, abandoned, and a continuation-in-part of Ser. No. 106,182, Dec. 21, 1979, Pat. No. 4,324,245, which is a continuation-in-part of Ser. No. 862,309, Dec. 20, 1977, abandoned. This application Feb. 8, 1980, Ser. No. 119,898

Int. Cl.³ A41B *13/02*

U.S. Cl. 604—385 26 Claims

1. A disposable diaper comprising: a moisture-permeable facing layer; an absorbent panel at one side of said facing layer, said absorbent panel being smaller than said facing layer so that marginal portions of the facing layer extend outwardly beyond the edges of said absorbent panel; a moisture-impervious backing layer at the side of said absorbent panel opposite said facing

layer, said backing layer being larger than said absorbent panel so that marginal portions of the backing layer extend outwardly beyond the edges of said absorbent panel; means bonding said facing and backing layers to one another; gathering means adjacent to at least one edge of said absorbent panel, and means securing said gathering means to at least one of said

layers, said gathering means being defined by an elastic member having a width dimension at least about ¼" and having a width-to-thickness ratio of at least about 100 and being effective over a width of at least ¼", whereby said gathering means provides improved body conformity without undue application of pressure upon the skin of the wearer.

4,388,076

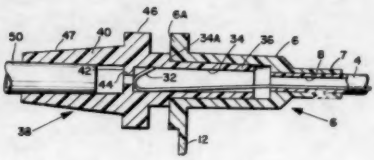
INTUBATING DEVICE

William E. Waters, Elizabeth, N.J., assignor to Biosearch Medical Products Inc., Somerville, N.J.

Filed Feb. 11, 1981, Ser. No. 233,482

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—165 **11 Claims**



1. An Enteric feeding device comprising:

a flexible tube having a self-sustaining diameter, free to be in any position at rest, and having an open proximal end and a discharge opening adjacent its distal end;

a hollow stylet connector plug having an inner diameter and removably secured to the proximal end of the tube;

a stylet extending into the bore of said plug and secured to said plug and extending through the interior of the tube to a point adjacent the distal end of the tube;

said stylet having an outer diameter smaller than the inner diameter of the tube and smaller than the inner diameter of the plug for passage of fluid between the stylet and the tube and the stylet and the plug; and

a hollow connector fitting integral with said plug and having a passage communicating with the interior of the plug.

4,388,077

COMPOSITION FOR WASHING FABRIC

Jules B. Ruck, St. Albert, Canada, assignor to W. E. Greer Ltd., Edmonton, Canada

Filed Aug. 7, 1981, Ser. No. 291,188
Int. Cl.³ D01C 1/02
U.S. Cl. 8—138 11 Claims

1. A method of washing denim, containing excess dye and sizing, comprising:

washing the denim in an aqueous solution containing an amphoteric surfactant, selected from the group consisting of at least one of a dicarboxylic aliphatic acid derivative of about 8 to 18 carbon atoms and a disubstituted imidazoline of about 6 to 22 carbon atoms, one or more builders, selected from the group consisting of perborate salts, phosphate salts, and organic builders, a carbonate salt pH builder, a metal carboxylate salt lubricant, and a light mineral oil lubricant; and

rinsing and drying the denim.

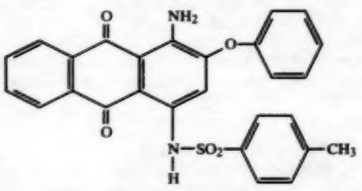
4,388,078

ANTHRAQUINONE DYESTUFF MODIFICATION

Thomas J. Thomas, and Robert G. Hoquet, both of Summerville, S.C., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Mar. 24, 1982, Ser. No. 361,223
Int. Cl.³ D06P 3/79
U.S. Cl. 8—514 15 Claims

1. A modification of the anthraquinone dyestuff of the formula



characterized by a melting point of 199°–200° C., with lattice plane spacings of strong intensity at 6.5 A°, 18.1 A° and 20.6 A°; of moderate intensity at 10.2 A°, 10.4 A°, 15.9 A°, 16.4 A°; of faint intensity at 21.0 A°, 28.5 A° and 28.9 A°.

4,388,079

COLOR SALT-CONTAINING OPTICAL BRIGHTENER COMPOSITION

Kazuaki Suzuki, Osaka, and Shohei Kuwabara, Suita, both of Japan, assignors to Showa Kagaku Kogyo Co., Ltd., Hyogo, Japan

Filed Jul. 20, 1981, Ser. No. 284,534
Claims priority, application Japan, Jul. 22, 1980, 55-99346
Int. Cl.³ C09B 23/14; D06P 1/41
U.S. Cl. 8—648 10 Claims

1. An optical brightener composition comprising at least one optical brightener and at least one color salt consisting of an optical brightener component having at least one anionic group and a color component having at least one basic group capable of forming a salt with the anionic group.

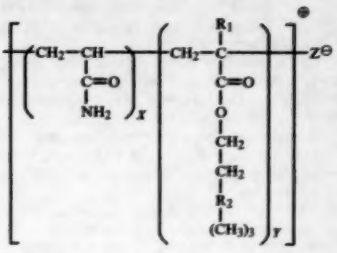
4,388,080

PROCESS FOR RECOVERY OF HIGH PURITY SILICON

Vijay K. Kapur, and Ashok K. Khanna, both of Northridge, Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 12, 1982, Ser. No. 348,468
Int. Cl.³ B01D 21/01; G01B 33/02
U.S. Cl. 23—293 R 9 Claims

1. A method for recovering high purity silicon from an aqueous slurry containing finely divided silicon particles of high purity comprising mixing with said slurry at least one silicon flocculating agent selected from the group consisting of alkaline earth metal oxide, alkaline earth metal hydroxide, a cationic polymer of the formula:



where X varies from 70 to 98 vol%; Y varies from 2 to 30 mol%; Z is selected from the group consisting of chloride and $CH_3SO_4^-$; R_1 is selected from the group consisting of H and $-CH_3$; and R_2 is selected from the group consisting of $-CH_3$ and $-CH_2CH_3$; said flocculating agent being employed in an effective silicon flocculating amount, holding said mixture until silicon flocs form, physically separating said silicon flocs from said slurry, and recovering said silicon flocs for re-use of the high purity silicon contained therein.

4,388,081

MOTOR FUEL

Lyle D. Burns, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 29, 1982, Ser. No. 393,238
Int. Cl.³ C10L 1/18
U.S. Cl. 44—78 11 Claims

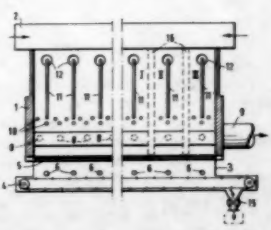
1. A fuel composition comprising a hydrocarbon suitable as a fuel for an internal combustion engine and an antiknock improving amount ranging from about 0.5 to about 10 weight percent of a phenoxyalcohol.

4,388,082

DEVICE FOR OBTAINING LARGE AMOUNTS OF COMBUSTIBLE GAS FROM CARBONACEOUS MATERIALS

Friedrich W. Guttmann, Bergisch Gladbach, and Horst Weigel, Cologne, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Nov. 3, 1981, Ser. No. 317,748
Int. Cl.³ C10B 53/02
U.S. Cl. 48—76 4 Claims



1. A device for gasification of carbonaceous materials and for recovery of combustible gases therefrom comprising:

a combustion chanber having a rectangular cross-section

and having an upper region, a central region wherein said combustion takes place, and a lower region;

a material charging means connected to said upper region of said combustion chamber for charging said combustion chamber with said carbonaceous material to be gasified;

a plurality of partitions in said combustion chamber disposed parallel to the flow of said carbonaceous material therethrough dividing said combustion chamber into a plurality of sub-chambers;

a plurality of air nozzles disposed in longitudinal walls of said combustion chamber for supplying primary combustion air to said central region of said combustion chamber;

a plurality of air supply lances entering said combustion chamber at said upper region and extending in the interior of said combustion chamber to said central region thereof for supplying additional primary combustion air to said central region;

a means for removal of said combustible gas from said combustion chamber communicating with said combustion chamber between said central and lower regions thereof;

a residue conveyor means for conveying residue of said carbonaceous material from said combustion chamber connected to said lower region of said combustion chamber; and

a means for supplying secondary combustion air to said residue between said lower region of said combustion chamber and said residue conveyor means for additional gasification of said residue

whereby supply of said primary and additional combustion air may be controlled for each of said sub-chambers for controlling combustion of said carbonaceous material therein.

4,388,083

MIXING BLOCK FOR EXPLOSIVE GAS MIXTURES DETONATED IN A COMBUSTION CHAMBER

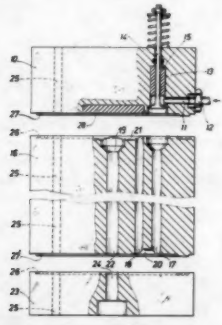
Wolfgang Mauz, Unterer Kasparswald 6, D-7022 Leinfelden-Echterdingen 3, Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,119

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 3041059

Int. Cl.³ F02M *21/02*

U.S. Cl. 48—180 R **7 Claims**



1. A mixing block structure for mixing components of an explosive gas mixture as they are delivered to an adjacent combustion chamber for confined explosion treatment of a solid object or material located therein, comprising a plurality of block-like bodies including:

a principal block body having opposite end surfaces and in which are provided

a first longitudinal bore extending from one to the other of said end surface, at least a part of which is a mixing chamber and which is disposed so as to lead mixed gas from said mixing chamber to said combustion chamber,

duct means for leading at least two components of said mixture separately to said mixing chamber, said duct means including a pair of longitudinal bores for at least one component gas of said explosive mixture, each bore of said pair extending from one to the other of said end surfaces, and

cross channels at opposite ends of one member of each of said pair of bores connecting it respectively to the other bore of said pair and to said mixing chamber, each said cross channel which connects with said mixing chamber being channeled in a said end surface of said principal block body and being open along its length at the said end surface, and

an input-end cap block body shaped to fit against the end surface of the principal block body which is more remote from said combustion chamber and having a gas line connection channel, for connecting an external gas supply line through said cap block to the longitudinal bore of said pair in said principal block body for at least one component gas, which channel is that one of said pair not connected to said mixing chamber by one of said cross channels, said cap block also having a check valve for each said gas line connection interposed therein, and in which input cap block said cross channel which joins with the mixing chamber is channeled in the end surface of said principal body which said input-end cap block fits and is open at said end surface along its length, so as to be closed along its length by said input-end cap block, and wherein in said principal block said duct means includes a said pair of longitudinal bores for each of at least two gaseous components of said explosive mixture and in which said input-end cap block has a said gas line connection channel and a said valve for each said at least two gaseous components of said explosive mixture

each body of said plurality of bodies also having bores located such that bolts are passed therethrough and thereby said bodies are held in alignment and screwed tightly together.

4,388,084

PROCESS FOR GASIFICATION OF SOLID CARBONACEOUS MATERIAL

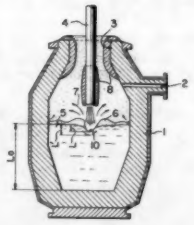
Koji Okane, Chiba; Shozo Okamura, Asomachi; Masanobu Sueyasu, Kawachinagano; Seiichi Masuda, Nishinomiya; Tsutomu Tanaka, and Koichi Tanaka, both of Chiba, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Aug. 6, 1981, Ser. No. 290,520

Claims priority, application Japan, Dec. 1, 1980, 55-169982

Int. Cl.³ C10J *3/46*

U.S. Cl. 48—197 R **10 Claims**



1. A process for gasification of solid carbonaceous material in which pulverized solid carbonaceous material is top-blown onto a molten iron bath stored in a furnace through a non-submerged lance toward a hot spot formed by means of a jet of a gasifying agent comprising at least oxygen, the gasifying agent being top-blown through a non-submerged lance, the solid carbonaceous material being blown by means of a carrier gas, and slag-forming material being optionally added into the

furnace by the lump or blown toward the hot spot, thereby the solid carbonaceous material being gasified, wherein the improvement comprises that the ratio L/L_0 of the depression depth L of the molten iron bath to the molten iron bath depth L_0 is maintained from 0.05 to 0.15, and the blowing velocity of the solid carbonaceous material is maintained from 50 to 300 m/sec so that formation of an adhered mass on the upper part of the furnace, hood or lance is suppressed.

4,388,085

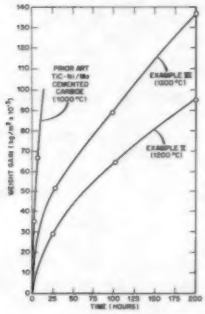
ABRASION RESISTANT ARTICLES BASED ON SILICON NITRIDE

Vinod K. Sarin, Lexington, and Sergej-Tomislav Buljan, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 167,258, Jul. 9, 1980, abandoned. This application Nov. 3, 1981, Ser. No. 317,811

Int. Cl.³ C04B *35/56, 35/58*

U.S. Cl. 51—307 **4 Claims**



1. A densified composite ceramic cutting tool which retains high creep resistance, fracture toughness, and resistance to oxidation at temperatures above 1200° C., said composite consisting essentially of from about 20 to about 60 volume percent of particles of a hard refractory material having an average size of less than about 5 microns selected from the group consisting of the carbides, nitrides, and mixtures thereof of titanium, vanadium, chromium, zirconium, niobium, molybdenum, hafnium, and tantalum uniformly distributed in a two phase matrix consisting essentially of a first phase of crystalline silicon nitride and a second refractory intergranular phase consisting essentially of silicon nitride, magnesium oxide and silicon dioxide, said magnesium oxide and silicon dioxide comprising from about 1 to about 10 weight percent of said two phase matrix, wherein said second phase contains less than 5 weight percent silicon dioxide, less than 3 weight percent additional additives including cation impurities, the hardness of said composite being greater than 93 on the Rockwell A scale and greater than the combined individual hardness of the fractional weight of silicon nitride times the hardness of silicon nitride plus the fractional weight of hard refractory material times the hardness of the hard refractory material, the density of said composite being greater than 97.5 percent of theoretical density and approaching 100 percent of theoretical density.

2. A densified composite cutting tool according to claim 1 wherein said hard refractory material comprises titanium carbide.

4,388,086

INTERCHANGEABLE AND DISPOSABLE FILTER CARTRIDGE AND METHOD OF REMOVING MOISTURE AND OIL FROM COMPRESSED BREATHABLE AIR

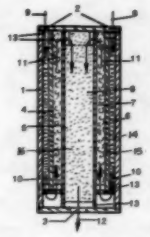
Heinz Bauer, Munich, and Kurt Herter, Eichenau, both of Fed. Rep. of Germany, assignors to Bauer-Kompressoren GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 123,996, Feb. 25, 1980, abandoned, which is a continuation of Ser. No. 938,411, Aug. 31, 1978, abandoned. This application Aug. 28, 1981, Ser. No. 297,233

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 7727993[U]

Int. Cl.³ B01D *53/02*

U.S. Cl. 55—75 **4 Claims**



4. The method of removing oil and water vapor from breathable compressed air consisting of the steps of passing said compressed air through a first adsorbent filtering medium providing removal of the majority of said water vapor from said compressed air, thereafter passing the thus coarsely dehumidified compressed air through a second adsorbent filtering medium providing adsorption removal of oil from said compressed air, and thereafter passing the thus coarsely dehumidified compressed air from which oil has been removed through a third adsorbent filtering medium providing removal of the remaining of said water vapor from said compressed air, whereby said compressed air having passed through said first, second and third adsorbent filtering media in sequence is substantially oil-free and moisture-free and wherein said first, second and third adsorbent filtering media are disposed each in one of three separate chambers in a single housing, at least two of said chambers being concentrically disposed in said housing and said three chambers being placed in serial communication with each other such that the compressed air to be filtered is sequentially circulated through the individual chambers in a labyrinth-like path for providing relatively long filtering travel of said compressed air, said first, second and third adsorbent filtering media being separated by air-pervious separators.

4,388,087

CYCLONIC SEPARATOR-FILTER

Joe D. Tipton, 3521 Miller Park Dr., Garland, Tex. 75042

Filed Aug. 7, 1981, Ser. No. 290,859

Int. Cl.³ B01D *46/04, 46/14, 50/00*

U.S. Cl. 55—96 **8 Claims**

1. A method of removing particulate matter from a gas, comprising, in combination:

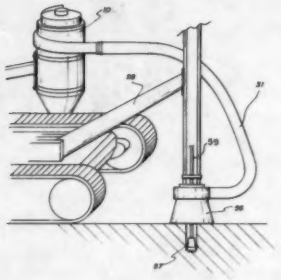
(a) connecting an inlet opening of a partitioned housing to a source of gas and particulate matter;

(b) causing said gas and particulate matter to flow through the housing by continuously inducing a vacuum in the housing with a centrifugal blower vacuum machine means that is connected to a gas discharge opening of the housing;

(c) causing separation of a first portion of the particulate matter from the gas by directing both the particulate matter and the gas to flow vortically in a cyclonic manner

around a cylindrical interior wall of a first chamber of the housing so that terrestrial gravitational force causes said first portion of the particulate matter to fall from the vortically flowing gas toward a bottom of said first chamber;

(d) causing separation of another portion of the particulate matter from the gas by directing the gas flow through a plurality of pleated paper filters, each filter being positioned in a low gas velocity core of the vortical gas and particulate matter flow and affixed over one of a like plurality of openings in a partitioning means between said first chamber and a second chamber of the housing, and each filter having a normal rated filtering capacity expressed in terms of a gas volume per unit time flowable through the filter and being utilized to filter such rated capacity of gas;



(e) continually cleaning said second portion of particulate matter from the filters with counterflowing gas pulses periodically directed through the filters from the second chamber to the first chamber wherein said counterflowing gas pulses are comprised of a compressed gas from an external source being discharged through a plurality of normally-closed valves, located in the second chamber, by rapidly opening and closing, in rotation, approximately one-fourth of said valves simultaneously;

(f) intermittently removing all of the separated first and second portions of particulate matter from the housing through a particulate matter discharge opening in the bottom of said first chamber; and

(g) continuously removing all of said gas flowing through the housing through the gas discharge opening by use of the same vacuum means used to induce the vacuum in the housing.

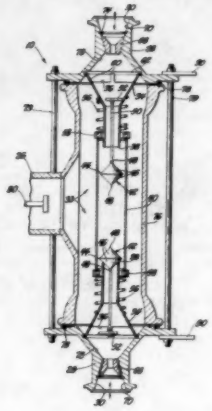
4,388,088

VACUUM CHAMBER ASSEMBLY FOR DEGASSING PARTICULATE MATERIAL

Walter J. Rozmus, Jr., and Walter J. Rozmus, both of Traverse City, Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Nov. 16, 1981, Ser. No. 322,022
Int. Cl.³ B03C 9/00; B65G 69/20
U.S. Cl. 55—101 **16 Claims**

1. An assembly for degassing gas-contaminated particulate material comprising a vacuum chamber (**10, 10'**) having first and second ends (**28, 28'**) with a flow passage (**30**) at each end for directing the flow of particulate material into and out of said vacuum chamber, said vacuum chamber having a vacuum outlet duct (**26**) midway between said first and second ends (**28, 28'**) thereof for removing gaseous contaminants from said vacuum chamber, flow control means (**32, 32'**) disposed within said vacuum chamber (**10, 10'**) between said first and second ends and having symmetrical ends for receiving particulate material from one of said flow passages (**30**) and directing the flow of particulate material to the other one of said flow passages while isolating the flow of particulate material from the surrounding space of said vacuum chamber through the central portion of the vacuum chamber adjacent said vacuum outlet duct (**26**) and for dispersing the particulate material while being subjected to the vacuum in the vacuum chamber adjacent said other one of said flow passages before the particulate



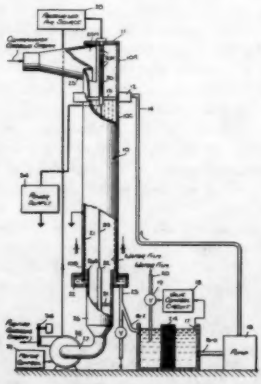
material flows out said other one of said flow passages whereby a quantity of particulate material may flow by gravity through said vacuum chamber from the first end to the second end and thereafter said vacuum chamber may be turned end-for-end so that the quantity of particulate material may flow by gravity, in the same manner back through said vacuum chamber from said second end to said first end thereof.

4,388,089

SELF-CLEANING ELECTRO-INERTIAL PRECIPITATOR UNIT

Robert B. Reif, Grove City, and Paul E. McCrady, Columbus, both of Ohio, assignors to Santek, Inc., Hollywood, Fla.

Continuation-in-part of Ser. No. 270,675, Jun. 4, 1981, which is a continuation of Ser. No. 898,556, Apr. 21, 1978. This application Jan. 15, 1982, Ser. No. 339,712
Int. Cl.³ B03C 3/16, 3/36, 3/78
U.S. Cl. 55—119 **6 Claims**



1. An inertial-electrostatic wet-wall precipitator unit for

extracting particles from a contaminated gaseous stream, the unit comprising:

(A) a vertically-mounted, grounded collector tube whose upper end is enclosed by a cover, said tube having an upper inlet section, a main section and an open-ended outlet section;

(B) a discharge electrode assembly including a wire extending through said main and outlet sections and having a high voltage imposed thereon to establish an electrostatic field in said sections which causes ions to be generated at said wire;

(C) means feeding a liquid into the tube at the junction of the inlet and main sections to form a liquid film on the inner surface of the tube which flows downwardly into and is discharged from the open end of the outlet section;

(D) means to introduce said contaminated gas stream tangentially into said inlet section;

(E) means coupled to said outlet section to produce a suction force drawing said tangentially-introduced stream from the inlet section at high velocity, said means to produce a suction force in combination with said means to introduce the gas stream tangentially imparting a swirling motion to the gas stream to cause said gaseous stream to flow in a helical path down the tube against the liquid film and to induce a swirling pattern therein, the centrifugal force created by the swirling motion urging particles carried by the gaseous stream to migrate toward and to be collected by the film to be flushed out of the tube, which migration is further promoted by the electrostatic force acting on the particles which are charged with ions in the field; and

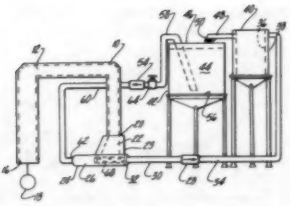
(F) means to periodically interrupt the flow of said gaseous stream through the tube to so modify the swirling film pattern as to cause the film to scrub particle deposits that form on the inner surface of the tube despite the flushing action.

4,388,090

AIR SCRUBBER

Arnet Streeter, 14897 Cruse, Detroit, Mich. 48227

Filed Jun. 29, 1981, Ser. No. 278,555
Int. Cl.³ B01D *47/00*
U.S. Cl. 55—228 **9 Claims**



1. A water utilizing device for removing impurities from air comprising:

a housing defining a mixing chamber;

a settling tank assembly adapted to contain said water;

means fluidly connecting said mixing chamber and said settling tank assembly for circulating a substantially continuous stream of said water, first from said settling tank assembly to said mixing chamber, and second from said mixing chamber to said settling tank assembly; said circulation means comprising first means fluidly connecting said settling tank assembly and said mixing chamber, first pump means fluidly connected to said first means for pumping said water from said settling tank assembly and to said mixing chamber so that water enters said mixing chamber in a first direction, and second means fluidly connecting said mixing chamber and said settling tank assembly, second pump means fluidly connected to said second means for pumping said water from said mixing chamber and to said settling tank assembly; and

means for conducting impurity laden air to said chamber so that said air enters said mixing chamber in a second direction, said second direction being substantially perpendicular to said first direction,

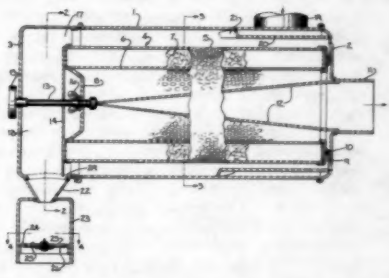
whereby said air is introduced into said water stream at a location in said stream between said first and second pumping means and is thereby cleansed of said impurities.

4,388,091

AIR CLEANER HAVING A DUST DUMPING VALVE

Mostafa M. Khosropour, Madison, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed Jul. 29, 1981, Ser. No. 287,888
Int. Cl.³ B01D *45/12, 46/48, 50/00*
U.S. Cl. 55—337 **9 Claims**



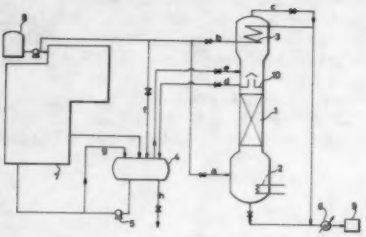
1. An air cleaner assembly for an internal combustion engine, comprising a housing having an air inlet and an air outlet adapted to communicate with the engine, filter means disposed in the housing between the inlet and the outlet, an outlet tube disposed in the lower portion of the housing, said outlet tube having a generally frustoconical configuration and having a large diameter upper end communicating with said housing and a small diameter lower end, a dust collecting container communicating with the lower end of the outlet tube and having a substantially greater cross-sectional area than said lower end of the outlet tube, said container having a lower surface spaced below said small diameter lower end, said lower surface of said container having opening means, a flexible sheet-like valve member disposed flatwise against the underside of the lower surface of said container, said valve member disposed to close off said opening means during periods of engine operation, dust being collected in said container, said valve member being constructed to move to an open position by the weight of collected dust in the container to thereby permit the dust to be discharged through said opening means, said small diameter lower end minimizing the draw back of dust from said container into said housing by engine vacuum when said valve member is opened.

4,388,092

METHOD FOR PROCESSING LNG FOR RANKINE CYCLE

Osamu Matsumoto, Inagi, and Ichizo Aoki, Yokohama, both of Japan, assignors to Chiyoda Chemical Engineering & Construction, Kanagawa, Japan

Filed Jan. 27, 1981, Ser. No. 228,920
Int. Cl.³ F25J *3/00*
U.S. Cl. 62—24 **3 Claims**



1. In an LNG gasification process in which a cold potential of LNG is converted into power with a Rankine cycle using a mixture of hydrocarbons C_1 to C_6 as a medium, a method for producing the medium to be used in said Rankine cycle using a single distillation tower and part of the LNG to be gasified as a raw material, comprising the steps of:

(a) continuously feeding part of an LNG supply to a bottom section of said distillation tower and another part of an LNG supply to a condenser as a refrigerant, stripping a C_1 component to accumulate C_2 and heavier components at a predetermined concentration inside said tower by heating LNG within a reboiler and partially condensing at said condenser, and recovering an overhead vapor mainly containing the stripped C_1 component and vaporized refrigerant at said condenser;

(b) terminating supply of LNG to said tower after the C_2 and heavier components inside said tower reach said predetermined concentration, completely stripping the C_1 component in said tower, and performing total condensation of a residual liquid comprising C_2 and heavier components using LNG as a refrigerant at said condenser, thereby sequentially extracting C_2 to C_4 components respectively from a top tray of said tower and recovering and storing the C_2 to C_4 components according to a required composition of the medium while recovering LNG used at said condenser in the form of a gas;

(c) draining and recovering residual heavier fractions from said tower after carrying out step (b);

(d) repeating a batch distillation operation comprising steps (a) to (c) to produce and store the required quantity of C_2 to C_4 components necessary for the medium; and

(e) adding a predetermined amount of LNG to the C_2 to C_4 components stored in step (d) to provide a composition and quantity of the medium for the Rankine cycle.

4,388,093

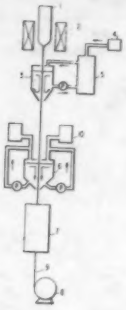
PROCESS FOR PRODUCING A GLASS FIBER FOR LIGHT TRANSMISSION

Takao Kimura, Mito, and Toru Yamanishi, Yokohama, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Dec. 23, 1981, Ser. No. 333,960
Claims priority, application Japan, Dec. 26, 1980, 55-187360
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—3.11 **4 Claims**

1. A process for producing an optical fiber wherein a fiber that has been drawn from a glass preform is coated with a resin composition curable with heat, ultraviolet rays, or electron beams, and then cured,

wherein before the drawn fiber contacts another solid object said fiber is cooled by being passed through a cooling means filled with a non-reactive liquid material which is



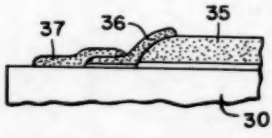
the same as said resin composition except that it is free from any compound that catalyzes curing of the resin, selected from among a curing agent, cross-linking agent, curing catalyst, curing accelerator, sensitizing agent, and a reactive diluent, and then the fiber is coated with said resin composition and cured.

4,388,094

METHOD AND APPARATUS FOR PRODUCING TUBULAR GLASS ARTICLE

Larry L. Carpenter, Corning, and Thomas G. Parham, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,546
Int. Cl.³ C03C *25/02*
U.S. Cl. 65—3.12 **18 Claims**



11. An apparatus for forming a continuous length of article comprising

an elongated mandrel,

means for applying particulate material to the exterior surface of said mandrel,

means for reciprocatingly moving said means for applying along at least a portion of the length of said mandrel to form a hollow porous article, and

means for indexing said article in a stop-and-go fashion with respect to said mandrel, whereby said article remains in a longitudinally fixed position with respect to said mandrel between brief periods during which said article is longitudinally moved to its next position with respect to said mandrel.

4,388,095

METHOD OF PRODUCING A GLASS LAYER ON AN INTERIOR SURFACE OF A HOLLOW BODY

Hartmut Schneider, and Egon Lebetzki, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 16, 1981, Ser. No. 284,103

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027592

Int. Cl.³ C03B *37/075;* C03C *17/02*

U.S. Cl. 65—18.2 10 Claims

1. In a method for manufacturing a layer of glass on an inner surface of a hollow body wherein a reactive gas mixture suitable for glass synthesis is introduced into a hot region within said hollow body and generated by exterior heating of said hollow body, with such reactive gas undergoing a chemical reaction at such region so that a material having the composition of glass is deposited on the inner surface of said hollow body as a layer which is melted into a clear glass film in the hot region, the improvement comprising wherein:

a combustible heating gas mixture is admixed with said reactive gas mixture and the resultant gas admixture is introduced into said hot region within said hollow body, said combustible gas mixture igniting in said hot region and burning therein during said chemical reaction and layer melting.

4,388,096

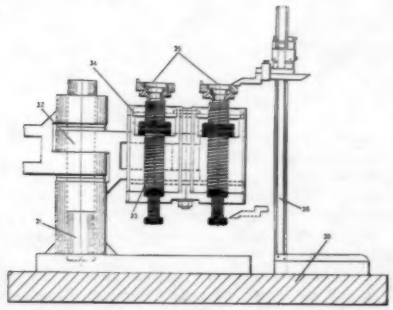
APPARATUS AND PROCESS FOR THE ALIGNMENT OF MECHANISMS AND/OR ARMS FOR THE MOLDS CHANGES IN MACHINES FOR THE MANUFACTURE OF GLASSWARE, THERMOPLASTIC ARTICLES OR SIMILARS

Alide B. Boschi, Monterrey, Mexico, assignor to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed Dec. 15, 1981, Ser. No. 330,884

Int. Cl.³ C03B *9/197*

U.S. Cl. 65—29 2 Claims



1. Apparatus for setting of mechanisms and/or arms in changing molds of machines for forming articles of glass thermoplastic or the like, which comprises:

support base;

a vertical support resting on said support base;

a fastener attached by one end to said vertical support and extending horizontally therefrom;

a false mold supported adjacent said vertical support by the free end of said fastener, from which measurements are made of the levels and centers of the mechanisms and/or arms of the machine, depending on the dimensions of the new mold;

adjustable setting means supported internally of said false mold to permit measurements of the vertical portions of either of its ends to simulate the real length of the molds;

variable replaceable gage members for positioning on the upper and lower ends of said adjustable setting means and which are adaptable to the various mechanisms of the machine which cooperate with the molds; and

measuring means to measure the movement of the adjustable setting means and variable replaceable setting means, along the reference support, to correspond with the real measurements of the molds to be used.

2. Process for setting of mechanisms and/or arms when changing molds of machines for forming articles of glass, thermoplastic or the like which comprises, in combination, the steps of:

providing a projecting reference point simulating the mold, from which the setting of the mechanisms and/or arms of the machine is effected;

making a first setting from said reference point by a suitable gage, positioning at said reference point, with measurements of the real mold;

making a second setting with replaceable variable gages, adapted to the height and center of the various mechanisms and/or arms of the machine;

measuring the location of each one of the mechanisms and/or arms of the machine that participate in the setting; placing the reference point with its setting devices and its measurements on the supports of the machine and adjusting the mechanisms and/or arms of the machine to correspond with the measurements made and the real functioning of each of them, obtained during the setting.

4,388,097

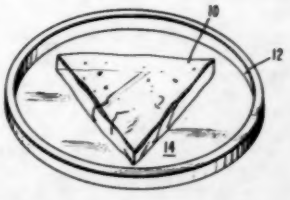
HOT-PRESSED FLUORIDE GLASSES

Roger R. Turk, Woodland Hills, and Morton Robinson, Agoura, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed May 28, 1981, Ser. No. 267,934

Int. Cl.³ C03B *23/20;* C03C *3/18*

U.S. Cl. 65—64 10 Claims



1. A process for hot-pressing two or more pieces of a fluoride glass or powder thereof to consolidate and form a unitary piece, said fluoride glass having a composition comprising about 47 to 62 mole percent of at least one component selected from the group consisting of HfF_4 and ZrF_4, about 23 to 38 mole percent of BaF_2 and up to about 15 mole percent of at least one component selected from the group consisting of ThF_4 and LaF_3, the process comprising pressing the fluoride glass at a temperature ranging from the softening point of the glass to just below the crystallization temperature of the glass and at a pressure which is at least sufficient to cause flow of the glass at that temperature.

4,388,098

APPARATUS FOR PRODUCING MULTI-COMPONENT GLASS FIBER PREFORM

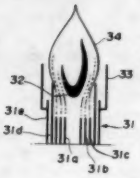
Shiro Takahashi, Mito; Kazuo Sanada, Chiba; Koichi Inada, and Osamu Fukuda, both of Sakura, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Fujikura Cable Works, Ltd., both of Tokyo, Japan

Division of Ser. No. 189,856, Sep. 22, 1980, Pat. No. 4,336,049. This application Feb. 26, 1982, Ser. No. 352,568

Claims priority, application Japan, Sep. 26, 1979, 54-123677; Jul. 4, 1980, 55-91292; Jul. 5, 1980, 55-91930

Int. Cl.³ B01J *10/00*

U.S. Cl. 65—157 1 Claim



1. Apparatus for producing a multi-component glass fiber preform, which comprises a multi-conduit burner having five concentric conduits, the centrally disposed first conduit and the second and third conduits adjacent thereto being flush with one another at their tip ends, the fourth conduit interposed between the third and outermost conduits extending axially beyond them, the first to fifth conduits serving to feed a gaseous glass raw material, a fuel gas, a nebulized aqueous solution of at least one metal salt, an inert gas and oxygen gas, respectively, and said burner having a nozzle adapted to be directed to a substrate.

4,388,099

PRESSURIZED FLUID DISTRIBUTING ARRANGEMENT FOR A FORMING TOOL FOR SHAPING THERMOPLASTIC MATERIAL

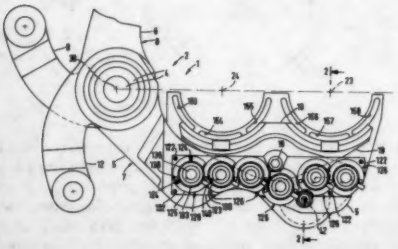
Helmut Hermening, Petershagen; Norbert Monden, Auetal; Lothar Schaar, Heuerssen; Wilhelm Schneider, Auetal, and Hans-Georg Seidel, Rinteln, all of Fed. Rep. of Germany, assignors to Hermann Heye, Obernkirchen, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,851

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040310

Int. Cl.³ C03B *9/38*

U.S. Cl. 65—267 14 Claims



1. A distributing arrangement for a pressurized fluid, especially air, for cooling a forming tool of a machine for forming thermoplastic material, especially molten glass, wherein the forming tool includes at least one split mold including mold segments which are respectively mounted on mold segment holders for movement therewith relative to each other and each of which is provided with a plurality of fluid channels for the flow of the pressurized cooling fluid therethrough, comprising a fluid distributing box mounted on each of the mold segment holders for movement therewith and including for each of the mold segments at least two branch channels; means for forming a dismountable common screw-free interface between the fluid channels of the respective mold segment and said branch channels of said fluid distributing box, each of said branch channels communicating across said interface with at least one of the fluid channels of the respective mold segment; and means for supplying the pressurized cooling fluid into said fluid distributing box.

4,388,100

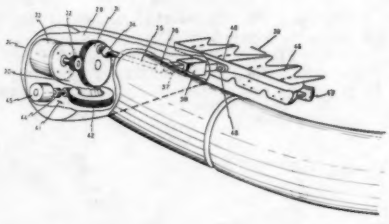
SHEAR MECHANISM FOR MACHINES FOR THE MANUFACTURE OF ARTICLES OF GLASS OR OTHER MATERIALS

Elio G. Marroquin, Monterrey, Mexico, assignor to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed Dec. 8, 1981, Ser. No. 328,610

Int. Cl.³ C03B *5/38*

U.S. Cl. 65—334 3 Claims



1. Glass gob shearing apparatus for use with automatic container molding machines comprising:

a housing;

a pair of horizontally spaced vertical shafts rotatably journaled in said housing each shaft including gear means affixed thereon and engaging each other so that said shafts rotate together by equal and opposite amounts;

a pair of horizontally extending shear blade supporting arms having one end affixed to each of said shafts respectively;

adjustable means joining said arms intermediate their ends;

means for vertically adjustably supporting said housing below the level of the feed orifices of an automatic glass feeder;

a pair of elongated hollow casings one coupled across the opposite ends of each of said arms respectively so that said casings face each other and the longitudinal axes of said casings are in substantial alignment;

means for independently adjusting the horizontal position of said casings along the longitudinal axis of said arms;

shear blade supporting means horizontally slidably supported within each of said casings respectively and carrying replaceable shear blades at their facing ends;

means within each of said casings for positively reciprocating said supporting means to effect cutting of molten glass from the feeder orifices into gobs; and

means for adjusting the time and length of stroke of said supporting means.

4,388,101
NON-PRESSURE NITROGEN CARRIER FERTILIZER SOLUTIONS AND DISPERSIONS AND PROCESS OF MANUFACTURE

Robert L. Lowder, Heyburn, Id., assignor to Occidental Chemical Agricultural Products, Inc., Los Angeles, Calif.

Filed Mar. 14, 1979, Ser. No. 20,399
Int. Cl.³ C05C 9/00; C05G 1/00
U.S. Cl. 71—29 19 Claims

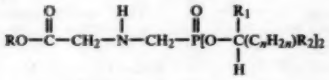
1. A process for preparing a non-pressure liquid fertilizer containing nitrogen and sulfur comprising
(a) mixing sulfuric acid in water,
(b) dissolving urea into the resulting solution, and
(c) adding anhydrous ammonia in an amount sufficient to bring the pH of the solution to between about 6 and 8.

4,388,102
ALKYLPHOSPHONATE DIESTERS OF N-PHOSPHONOMETHYLGLYCINATE AS HERBICIDES

William R. Purdum, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 19, 1981, Ser. No. 275,485
Int. Cl.³ A01N 57/18; C07F 9/40
U.S. Cl. 71—86 36 Claims

1. A compound useful as a herbicide of the formula



wherein R is lower alkyl; R_1 is selected from the group consisting of hydrogen, lower alkyl and lower alkoxycarbonyl, R_2 is selected from the group consisting of lower alkoxy carbonyl and a

group wherein Z is lower alkyl; and n is an integer from 0 to 3.

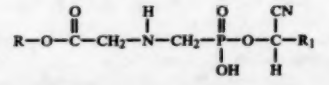
25. A herbicidal method which comprises contacting a plant with a herbicidally effective amount of a compound of claim 1.

4,388,103
ALKYLPHOSPHONATE MONOESTERS OF N-PHOSPHONOMETHYLGLYCINATE AS HERBICIDES

William R. Purdum, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 19, 1981, Ser. No. 275,533
Int. Cl.³ A01N 57/18; C07F 9/40
U.S. Cl. 71—86 27 Claims

1. An alkylphosphonate monoester of N-phosphonomethylglycinate of the formula



wherein R is lower alkyl, lower alkoxy lower alkyl, halo lower alkyl, or phenyl lower alkyl and R_1 is selected from the group consisting of hydrogen and lower alkyl.

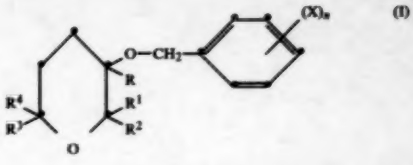
19. A herbicidal method which comprises contacting a plant with a herbicidally effective amount of a compound of claim 1.

4,388,104
3-PHENYLMETHOXYTETRAHYDROPYRAN HERBICIDES

James E. Powell, Ripon, Calif., and Michael D. Barker, Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 26, 1981, Ser. No. 314,612
Int. Cl.³ A01N 43/00; C07D 309/10, 309/12, 317/08
U.S. Cl. 71—88 3 Claims

1. A compound of the formula:



(I)

wherein R is hydrogen, phenyl or alkyl of from one to four carbon atoms, R^1 is hydrogen or alkyl of from one to four carbon atoms, R^2 is hydrogen, R^3 is hydrogen, alkyl of from one to four carbon atoms, phenyl or is a moiety $R^5—O—CH_2CH_2—O)_mCH(R^6)—$, wherein m is zero, one or two, R^4 is hydrogen, alkyl of from one to four carbon atoms, or a moiety $R^5—O((CH_2CH_2)—O)_mCH(R^6)—$, R^5 is alkyl of from one to six carbon atoms and R^6 is hydrogen or alkyl of one to four carbon atoms, with the proviso that R^3 and R^2 together can represent the moiety $—C(R^7)_2—O—$, wherein R^7 is hydrogen or alkyl of from one to four carbon atoms, R^2 representing the oxa (—O—) oxygen therein, X is halogen, and n is zero, one or two.

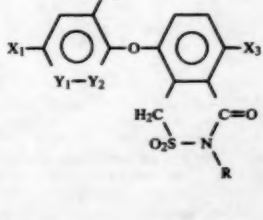
3. A method for killing unwanted plants at a locus which comprises applying to the locus to be protected a herbicidal amount of a compound of claim 1 or a composition containing it.

4,388,105
HERBICIDAL CYCLIC SULFONAMIDES OF PHENOXYBENZOIC ACIDS

James T. Bahr, Hopewell, N.J., assignor to Rhone-Poulenc Agrochimie, Lyons, France

Filed Jul. 27, 1981, Ser. No. 287,350
Int. Cl.³ A01N 43/72; C07D 279/02
U.S. Cl. 71—91 5 Claims

1. A herbicidal compound of the formula:



where:
(i) Y_1 is N or CH;
(ii) Y_2 is N or CX_4, provided that Y_1 is not N when Y_2 is CX_4;
(iii) X_1 and X_2 are the same or different and selected from the group consisting of halogen or CF_3;
(iv) X_3 is NO_2 or halogen;
(v) X_4 is H, halogen or CF_3; and
(vi) R is H or C_1 to C_{12} alkyl.

4,388,106
OXIME DERIVATIVES FOR PROTECTING PLANT CROPS

Werner Föry, Basel; Henry Martin, Allschwil, both of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

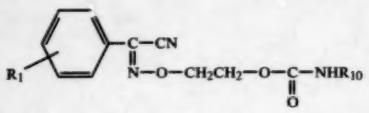
Division of Ser. No. 68,263, Aug. 20, 1979, Pat. No. 4,353,735. This application Jul. 14, 1982, Ser. No. 398,168

Claims priority, application Switzerland, Aug. 31, 1978, 9201/78

Int. Cl.³ A01N *37/34*; C07C *121/80*

U.S. Cl. 71—105 4 Claims

1. A compound of the formula



wherein

R_1 is hydrogen or cyano, and

R_{10} is lower alkyl or phenyl optionally substituted by halogen or trifluoromethyl.

4. An antidote composition for use in safening plants against the harmful effects of potent herbicides, which comprises (1) a compound according to claim 1 and (2) a carrier.

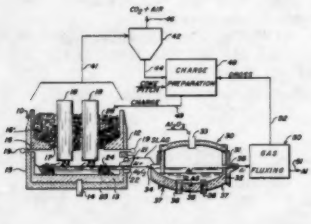
4,388,107
MINIMUM-ENERGY PROCESS FOR CARBOTHERMIC REDUCTION OF ALUMINA

Robert M. Kibby, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 140,842, Apr. 16, 1980, Pat. No. 4,334,917, and a continuation-in-part of Ser. No. 161,292, Jun. 20, 1980, which is a continuation-in-part of Ser. No. 7,986, Jan. 31, 1979, Pat. No. 4,216,010, which is a continuation-in-part of Ser. No. 881,786, Feb. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 785,676, Feb. 7, 1977, abandoned. This application Nov. 10, 1980, Ser. No. 205,451

Int. Cl.³ C22B *21/02*

U.S. Cl. 75—10 R 40 Claims



1. A carbothermic process for producing aluminum containing aluminum carbide, comprising the following steps:

A. on a furnace hearth, reacting a mixture comprising solid aluminum carbide and carbon with a liquid slag comprising alumina and aluminum carbide, while providing heat input sufficiently high to produce vapors comprising aluminum metal, aluminum monoxide, and carbon monoxide, and liquid aluminum containing aluminum carbide;

B. decomposing said slag in the absence of reactive carbon or solid aluminum carbide to produce additional aluminum and vapors comprising aluminum metal, aluminum monoxide, and carbon monoxide;

C. passing said vapors produced in steps A and B through at least one zone where said vapors react to produce alumina, aluminum tetraoxycarbide, and aluminum carbide;

D. employing the product of step C as part of said mixture in step A which reacts with said liquid slag on said furnace hearth; and

E. recovering product aluminum containing aluminum carbide from step B.

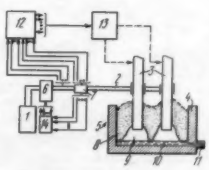
4,388,108
METHOD AND APPARATUS FOR SMELTING CHARGE MATERIALS IN ELECTRIC ARC FURNACE

Vladimir L. Rozenberg, ulitsa Novolesnaya, 18, korpus, 1, kv. 148; Igor P. Brukovsky, 1 Mosfilmovsky pereulok, 5, korpus 2b, kv. 16, both of Moscow; Sergei M. Nekhamin, ulitsa Chekhova, 11, kv. 32, Pushkino Moskovskoi oblasti; Mark A. Ryss, ulitsa Rossiiskaya, 32, kv. 7., Chelyabinsk; Boris B. Pelts, ulitsa Lesnaya, 62/13, kv. 157, Moscow; German V. Serov, Shipilovskaya ulitsa 38, korpus 1, kv. 188, Moscow; Alexandr N. Popov, ulitsa Akademika Pavlova, 13, korpus 4, kv. 58, Moscow; Gennady D. Bogoljubov, Perovskoe, 10, kv. 16, Moscow; Leonid A. Ryazantsev, 3 Karacharovskaya ulitsa, 8, korpus 1, kv. 21, Moscow; Jury S. Ioffe, Yaroslavskaya ulitsa, 1/9, kv. 11, Moscow; Grigory B. Fridman, ulitsa Entuziastov, 7, kv. 45, Zaporozhie; Leonid I. Boitsov, prospekt Lenina, 149, kv. 29, Zaporozhie; Petr D. Andrienko, ulitsa Novgorodskaya, 5, kv. 96, Zaporozhie; German V. Kovalev, ulitsa Tennisnaya, 3, kv. 12, Zaporozhie; Sergei A. Sankov, ulitsa Vestofonskaya, 18, kv. 1, Zaporozhie; Vladimir V. Fomenko, ulitsa Chervono Kinota, 24, Zaporozhie; Valery I. Stalev, ulitsa Girshmana, 18, kv. 21, Kharkov; Pavel K. Greditor, prospekt Lenina, 129, kv. 31, Zaporozhie; Stanislav V. Petrov, ulitsa Gyardeitsev Shirapentsev, 63, kv. 44, Kharkov, and Vladimir G. Mashyanov, ulitsa Voroshilova, 31, kv. 116, Zaporozhie, all of U.S.S.R.

Continuation of Ser. No. 186,244, Sep. 11, 1980. This application Jan. 15, 1982, Ser. No. 339,651

Int. Cl.³ H05B *7/18*; C22B *4/00*

U.S. Cl. 75—10 R 4 Claims



1. In a method for smelting charge materials within a bath of an electric arc furnace with nonconsumable electrodes being provided with electric current having a direction which changes periodically, comprising the steps of:

loading said charge materials into said bath of the electric arc furnace,

smelting said charge materials,

carrying out redox reactions, and

tapping finished melt and slag;

the improvement comprising the steps of:

converting said electric current into a multi-phase current, having a base frequency which is within the range of 0.05 to 30 Hz,

providing said converted electric current to said electrodes of the electric arc furnace,

providing a stable position of said electrodes within said bath of the electric arc furnace,

monitoring variations in the converted current and voltage at said electrodes,

controlling the duration of a no-current condition interval between oppositely-directed half-waves of said converted current provided to said electrodes as a function of the monitored current and voltage, and said base frequency of said current, and

controlling said base frequency of said converted current within said range of 0.05 to 30 Hz.

4,388,109

PROCESS FOR THE PRODUCTION OF SILVER POWDER FROM SILVER CHLORIDE, SULPHATE OR SULPHIDE

Wasyl Kunda, Edmonton, Canada, assignor to Sherritt Gordon Mines Limited, Toronto, Canada

Continuation-in-part of Ser. No. 179,603, Aug. 9, 1980, Pat. No. 4,306,902. This application May 18, 1981, Ser. No. 264,724
The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.
Int. Cl.³ B22F 9/00; C22B 11/00
U.S. Cl. 75—0.5 B **7 Claims**

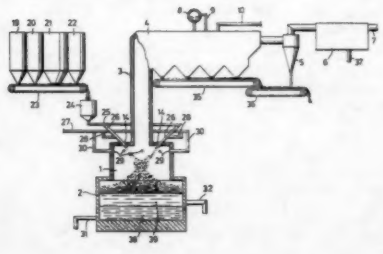
1. A process for the production of elemental silver from a silver salt selected from the group consisting of silver chloride, silver sulphate and silver sulphide, said process comprising mixing the silver salt with sodium carbonate, and heating the mixture at a temperature in the range of from about 500° C. to about 650° C. to produce a product mixture comprising elemental silver powder and a product sodium salt selected from the group consisting of sodium chloride and sodium sulphate, cooling the product mixture, and removing the product sodium salt and any unreacted sodium carbonate from the elemental silver powder by washing with water.

4,388,110

METHOD FOR RECOVERING THE METAL CONTENT OF COMPLEX SULPHIDIC METAL RAW MATERIALS

Torsten E. Jensfelt, Stocksund, and Stig A. Petersson, Skellefteåhamn, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Nov. 18, 1981, Ser. No. 322,685
Claims priority, application Sweden, Dec. 1, 1980, 8008426
Int. Cl.³ C22B 1/07
U.S. Cl. 75—21 **7 Claims**



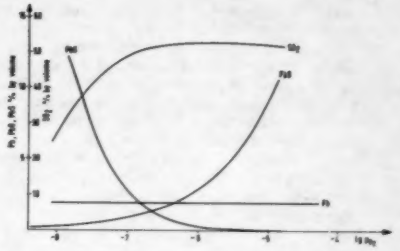
1. A method for recovering the metal content of complex sulphidic metal raw materials by autogenous flame smelting with an oxygen-containing gas, comprising melting said raw materials in a furnace in the presence of an oxygen surplus while adding an acid slag former containing silica to form a melt which is poor in sulphur and comprises mainly metal-oxide silicate; separating from the silicate phase any metal phase formed in the furnace; and recovering non-iron metals present in the silicate phase by selective reduction.

4,388,111

PROCESS FOR THE RECOVERY OF LEAD FROM A LEAD-BEARING SULFIDE CONCENTRATE

Timo T. Talonen, Nakkila, and Tuula S. M. Mäkinen, Vanha-Ulvila, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Apr. 15, 1981, Ser. No. 254,413
Claims priority, application Finland, Apr. 16, 1980, 801213
Int. Cl.³ C22B 13/00
U.S. Cl. 75—26 **2 Claims**



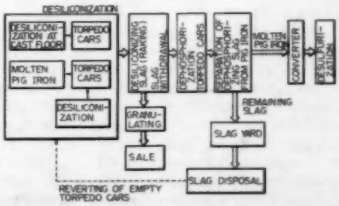
1. A process for the recovery of lead from a lead-bearing sulfidic concentrate by heating the concentrate in such a manner that lead and lead compounds pass into the gas phase, comprising heating the sulfidic concentrate to a temperature of between 1373° K. and 1773° K. at an oxygen pressure lower than $2 \cdot 10^{-7}$ atm at 1373° K. and lower than $2 \cdot 10^{-4}$ atm at 1773° K., then oxidizing the gas phase and cooling the gas phase to a temperature no lower than 1073° K. at an oxygen pressure no lower than 10^{-12} atm to cause lead compounds of the gas phase including sulfides and oxides of lead to react with each other to produce elemental lead, condensing a major portion of the elemental lead produced at a temperature of at least 1272° K. and an oxygen pressure between 10^{-10} atm, and condensing the remainder of said elemental lead at a temperature below 1272° K.

4,388,112

STEELMAKING PROCESS WITH SEPARATE REFINING STEPS

Hiroyuki Nakashima, Kisarazu; Morihiro Sumida, and Hiroki Goto, both of Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed Mar. 13, 1981, Ser. No. 243,451
Claims priority, application Japan, Mar. 21, 1980, 55-34693; Jan. 23, 1981, 56-8855
Int. Cl.³ C21C 7/00, 7/02
U.S. Cl. 75—51 **31 Claims**



1. A process for making steel by separate steps comprising:
(a) a first step of desiliconizing molten pig iron produced by means of a blast furnace equipped with a cast floor, said desiliconizing being carried out in a pig runner on the cast floor of said blast furnace, by incorporating in said

molten pig iron an oxidizer selected from the group consisting of an iron oxide and an oxygen-containing gas, whereby a slag is produced produced by said desiliconization, while mcintaining the basicity of said slag at 0.4–2.8 throughout said desiliconization, to reduce the silicon content of the molten pig iron to not more than 0.2% and

separating said slag from said molten pig iron;

(b) a second step of dephosphorizing the molten pig iron of step (a),

said dephosphorization being carried out by transferring the molten pig iron of step (a) to an iron ladle or mixer car and

incorporating in said molten pig iron of step (a) a first refining agent comprising a calcium oxide-containing material and an oxidizer selected from the group consisting of an oxygen-containing gas and iron oxide, whereby a further slag is produced by said dephosphorization, while maintaining the basicity of said further slag at not less than 3 during said dephosphorization, to reduce said phosphorus content of said molten pig iron to not more than about 0.040%, and

separating the resultant slag from the molten pig iron,

(c) a third step of decarburizing said molten pig iron of step (b),

said decarburization being performed by transferring the molten pig iron from step (b) to a vessel which is a converter, and

blowing an oxygen-containing gas into said molten pig iron in said converter to decarburize said molten pig iron to a desired level to thereby produce molten steel and

(d) a fourth step of desulfurizing said molten steel of step (c),

said desulfurization being performed by transferring said molten steel from step (c) to another vessel and

incorporating in said molten steel a second refining agent consisting essentially of calcium oxide, thereby causing said desulfurization to occur.

4,388,113

METHOD OF PREVENTING DAMAGE OF AN IMMERSED TUYERE OF A DECARBURIZATION FURNACE IN STEEL MAKING

Yozo Takemura, Tokyo; Isao Kobayashi, Tokai; Yasuhiro Akita, Chita, and Kaoru Kato, Tokai, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 24, 1981, Ser. No. 305,259

Claims priority, application Japan, Sep. 26, 1980, 55-133966; Sep. 26, 1980, 55-133967; Sep. 26, 1980, 55-133968; Feb. 23, 1981, 56-25161

Int. Cl.³ C21C *7/00*; C21B *7/10*

U.S. Cl. 75—51 **35 Claims**

1. A method of preventing damage to an immersed tuyere for use in an oxygen steel making furnace used for a decarburization refining process, comprising the steps of:

forming a gas-powder mixture consisting of a gas emitting particulate material of an amount sufficient to generate a gas for stirring a molten metal bath and a carrier gas other than oxygen;

blowing said gas-powder mixture into said molten metal bath through said immersed tuyere to form a layer of said gas-powder mixture of an increased momentum on the inner peripheral rim and immediately above the nozzle of said immersed tuyere; and

cooling the molten metal around the tip end of said immersed tuyere by the absorption of heat caused by the endothermic decomposition reaction of said particulate material, while, stirring said molten metal bath by the combined effect of said carrier gas jet, gas generated through said decomposition reaction and said particulate material remaining undecomposed;

whereby the entry of said molten metal into said tip end of said immersed tuyere is prevented by the combined effect of the increased momentum, cooling and stirring effect, to prevent clogging, blockage and/or wear of said tip end of said immersed tuyere.

4,388,114

ANTI-WEAR SINTERED ALLOY

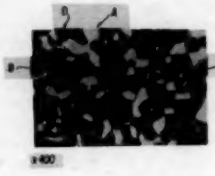
Tetsuya Suganuma, Nagoya; Yoshio Fuwa, Toyota; Shuichi Fujita, Toyota, and Takahashij Yoshitaka, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 5, 1980, Ser. No. 213,239

Claims priority, application Japan, Mar. 4, 1980, 55-27107

Int. Cl.³ C22C *38/02, 38/04, 38/20, 38/36*

U.S. Cl. 75—243 **12 Claims**



1. An anti-wear sintered alloy consisting essentially of chromium 2.5–7.5 weight %, manganese 0.10–3.0 weight %, phosphorus 0.2–0.8 weight %, copper 1.0–5.0 weight %, silicon 0.5–2.0 weight %, molybdenum 0–3 weight %, and carbon 1.5–3.5 weight %, the balance being Fe and less than 2% impurities.

4,388,115

AQUEOUS INK COMPOSITION

Masatoshi Sugiyama; Akira Ogawa, both of Minami-ashigara, and Shinichi Imai, Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

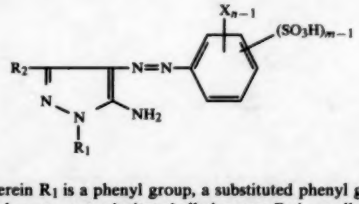
Filed Jun. 15, 1981, Ser. No. 274,045

Claims priority, application Japan, Jun. 13, 1980, 55-79925

Int. Cl.³ C09D *11/02*

U.S. Cl. 106—22 **9 Claims**

1. An aqueous yellow ink composition comprising: a water-soluble dye and a wetting agent dissolved in water, wherein said water-soluble dye has the formula (I):



(I)

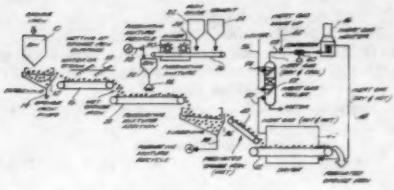
wherein R_1 is a phenyl group, a substituted phenyl group, an alkyl group or a substituted alkyl group; R_2 is an alkyl group, a phenyl group, a substituted phenyl group, a cyano group, a hydroxyl group, an alkoxy group, an amino group, an acylamino group, an anilino group, a ureido group, an alkoxycarbonyl group or a carbamoyl group; X is a halogen atom, an alkyl group or an alkoxy group; n is 1, 2, 3, 4 or 5; and m is 1, 2 or 3, provided that the sulfo group in the formula (I) may be an alkali metal salt, an ammonium salt or an organic amine salt.

4,388,116

PASSIVATION OF SPONGE IRON

David H. Carrillo-Cantu, and Asdrubal Trevino-Alanis, both of Monterrey, Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed Aug. 4, 1981, Ser. No. 289,999
Int. Cl.³ C04B 7/22
U.S. Cl. 106—97 **18 Claims**



1. A method of passivating sponge iron pellets comprising the steps of wetting said sponge iron pellets, applying to the wetted pellets a passivating amount of a pulverulent mixture of about 40% to 70% by weight of iron oxide particles and about 60% to 30% by weight of hydraulic cement particles and drying the thus treated sponge iron pellets.

4,388,117

PROCESS AND APPARATUS FOR PRODUCING PORTLAND AND OTHER HYDRAULIC CEMENTS

Eddie K. Wilson, Sr., 6915 Silver Maple Cove, Memphis, Tenn. 38138

Continuation-in-part of Ser. No. 165,500, Jul. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 947,599, Oct. 2, 1978, Pat. No. 4,213,791, which is a continuation-in-part of Ser. No. 690,510, May 27, 1976, abandoned. This application Jul. 21, 1981, Ser. No. 285,452
Int. Cl.³ C04B 7/02
U.S. Cl. 106—100 **21 Claims**

1. A process for producing a hydraulic cement, such as portland cement, said process comprising: maintaining a melt within a cavity that is lined with a material having substantially the same chemical composition as the desired cement, the melt also having substantially the same chemical composition as the desired cement, whereby the melt does not react with the material that lines the cavity; introducing appropriate feed materials into the melt within the cavity with the feed materials containing compounds suitably proportioned for the desired cement; heating the melt within the cavity sufficiently to enable the feed materials to be in a molten condition and to chemically combine within the melt, the heating being effected by electrical energy; withdrawing the melt from the cavity; and cooling the withdrawn melt to solidify it into a solid substance that has the chemical constituency and properties of the desired cement.

4,388,118

BLACK PIGMENT FREE OF HEAVY METALS

Richard A. Eppler, Timonium, Md., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Mar. 15, 1982, Ser. No. 357,959
Int. Cl.³ C09C 1/02
U.S. Cl. 106—306 **5 Claims**

1. An inorganic black pigment having a distorted perovskite structure in which the net oxide composition after calcination at a temperature between 1200° and 1900° F. consists essentially of (a) 25 to 84 mol % of an oxide of manganese and (b) 75 to 16 mol % strontium oxide and/or calcium oxide, together with residual amounts of carbonates and/or mineralizers.

4,388,119

DIBENZYLIDENE SORBITOL COMPOSITION AND PROCESS FOR PREPARATION THEREOF

Hiroshi Uchiyama, Hirakata, Japan, assignor to E. C. Chemical Ind. Co., Ltd. and C. Itoh & Co., Ltd., both of Osaka, Japan

Filed Jul. 13, 1981, Ser. No. 282,739
Claims priority, application Japan, Jul. 16, 1980, 55-96188
Int. Cl.³ C08K 5/15
U.S. Cl. 106—316 **7 Claims**

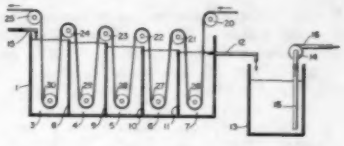
1. A composition consisting essentially of 95 to 50 parts by weight of solid powdery dibenzylidene sorbitol and 5 to 50 parts by weight of at least one higher fatty acid of the formula $CH_3(CH_2)_nCOOH$ in which n is an integer of from 14 to 20, the total weight of said two components being 100 parts by weight, the surface of the dibenzylidene sorbitol being coated with the higher fatty acid.

4,388,120

ELECTROCHEMICAL CLEANING CASCADE WASH

Jon K. West; Arthur J. Catotti, both of Gainesville, Fla., and Michael J. Wynn, Latham, N.Y., assignors to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 191,220, Sep. 26, 1980, abandoned. This application May 7, 1982, Ser. No. 375,907
Int. Cl.³ B08B 1/02
U.S. Cl. 134—15 **2 Claims**



1. In a process of making battery plates, a method of removing impurities comprising sodium hydroxide from a surface of flexible strip material and recycling said sodium hydroxide, said flexible strip material comprising a mild steel substrate covered with a porous nickel layer filled with nickel hydroxide or cadmium hydroxide, said method comprising:

providing a system for washing said flexible strip material comprising a wash tank containing a plurality of vertically-oriented plates dividing said tanks into a first wash zone, a final wash zone, and at least one intermediate wash zone, the upper ends of said plates being at progressively lower levels in progressing from said final wash zone to said first wash zone;

introducing rinse water into said final wash zone at a rate from about 0.25 to about 0.5 gallons per minute and passing it through said intermediate and first wash zones, said rinse water flowing from each of said final and intermediate wash zones to the next succeeding wash zone over the upper ends of said plates dividing said tank into separate wash zones, thereby cascading from each wash zone to the next succeeding wash zone;

introducing said strip material having impurities comprising sodium hydroxide on at least one surface of said strip material into said first wash zone at a rate up to about 15 feet per minute and passing it through said first, intermediate, and final wash zones countercurrently to the flow of said rinse water whereby sodium hydroxide on the surface of said strip material is dissolved by said rinse water to produce a sodium hydroxide-containing effluent, said strip material following a serpentine path through said system, passing downwardly and then upwardly within each of said washing zones, said strip material being raised vertically from the surface of liquid within said wash zones a sufficient distance to permit at least a portion of the rinse water to drain back into the wash zone from which the strip emerged; and,

recycling the resulting effluent.

4,388,121

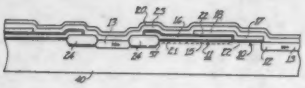
REDUCED FIELD IMPLANT FOR DYNAMIC MEMORY CELL ARRAY

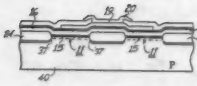
G. R. Mohan Rao, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 21, 1980, Ser. No. 132,703

Int. Cl.³ H01L *21/263*; G11C *11/40, 17/00*

U.S. Cl. 148—1.5 **9 Claims**





1. A method of making a dynamic semiconductor memory cell of the one-transistor type comprising the steps of:

masking a face of a silicon body to expose field areas and cover transistor and capacitor areas,

subjecting said face to an impurity ion implant at a dosage of not more than about 3×10^{12} atoms per sq. cm. to produce implanted regions in said field areas but not in said transistor and capacitor areas,

annealing said body in an inert atmosphere after said implant,

thereafter growing field oxide in said field areas by exposing said face to an oxidizing atmosphere at high temperature thereby creating lightly doped channel stop regions from said implanted regions,

forming electrodes at said transistor and capacitor areas to provide a memory cell, wherein the step of forming electrodes includes:

applying a first layer of conductive material over said face of the semiconductor body to form a capacitor electrode overlying a first semiconductor region,

applying a second layer of conductive material on said face partially overlying the first layer and overlying a second semiconductor region, the first and second semiconductor regions including said capacitor and transistor areas, respectively,

applying a metal layer to said face to define at least one elongated strip overlying the first and second layers and making contact to at least one of said electrodes.

4,388,122

METHOD OF MAKING HIGH STRENGTH HOT ROLLED STEEL SHEET HAVING EXCELLENT FLASH BUTT WELDABILITY, FATIGUE CHARACTERISTIC AND FORMABILITY

Masatoshi Sudo; Shunichi Hashimoto, and Shoji Kambe, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Aug. 3, 1981, Ser. No. 289,280

Claims priority, application Japan, Aug. 11, 1980, 55-110829; Dec. 15, 1980, 55-177841; Dec. 15, 1980, 55-177842

Int. Cl.³ C21D *8/02*

U.S. Cl. 148—12 F **10 Claims**

1. A method of producing high strength, hot rolled, steel sheet with excellent flash butt weldability, fatigue characteristic and formability, having a composite structure consisting of polygonal ferrite and bainite, and containing from 0.01 to 0.15% by wt. of C, from 0.01 to 1.5% by wt. of Si, and from 0.3 to 2.0% by wt. of Mn, the area ratio of the bainite being from 3 to 60%, said steel sheet being produced by a cooling treatment consisting of: upon completion of the hot rolling, cooling the hot rolled steel sheet for 3 to 20 seconds at a cooling rate of 4° to 10° C./sec; thereafter cooling the steel sheet at a cooling rate of 50° to 100° C./sec, and winding up the sheet thus cooled at a temperature of from 350° to 575° C.

4,388,123

METHOD FOR THE MANUFACTURE OF STEEL SUITABLE FOR ELECTRIC-WELDED TUBULAR PRODUCTS HAVING SUPERIOR RESISTANCE TO SOUR GAS

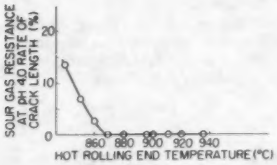
Hiroshi Murayama, Tokai, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 297,971

Claims priority, application Japan, Sep. 5, 1980, 55-122221

Int. Cl.³ C21D *8/02*

U.S. Cl. 148—12 F **3 Claims**



1. In a method for producing a steel suitable for electric-welded tubular products which has a superior resistance to sour gas containing H_2S and other S-bearing gases, the improvement which comprises providing a steel consisting essentially of, as a basic composition, C≦0.12 wt. %, 0.5–1.0% Mn, 0.10–0.25% Si, P≦0.015%, S≦0.0020%, Nb≦0.050%, 0.0010–0.0060% Ca, the remainder Fe and unavoidable and negligible traces of impurities, subjecting said steel to a hot rolling step, said hot rolling step being ended at a temperature above 870° C., further rapidly cooling said steel on a runout table following said hot rolling step at an average cooling rate of from 5° C. to 30° C. per second, to form an acicular ferritic structure, and finally, subjecting the steel to a coiling step at a temperature below 570° C.

4,388,124

CYCLIC OXIDATION-HOT CORROSION RESISTANT NICKEL-BASE SUPERALLOYS

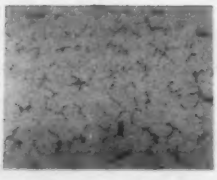
Michael F. Henry, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 34,168, Apr. 27, 1979, abandoned. This application Sep. 22, 1980, Ser. No. 189,633

The portion of the term of this patent subsequent to Aug. 18, 1998, has been disclaimed.

Int. Cl.³ C22C *19/05*

U.S. Cl. 148—404 **16 Claims**



1. An article of manufacture exhibiting cyclic oxidation-hot corrosion resistant properties comprising a non-eutectic nickel-

base superalloy having a microstructure substantially free of carbides in the form of aligned fibers consisting essentially of, on a weight basis, 1–9% Re, 0–2% Ti, at least 2% Al, 3–12% Cr, 1–5.9% Ta, 0–0.5% C, 2–12% Co, 2–10% W, less than 1% V, 2–10% Mo, 0–5% Cb, 0–3% Hf, 0–1.5% Zr and 0–0.20% B, the balance being essentially Ni and incidental impurities.

9. The claim 1 article wherein the article is a unidirectionally solidified anisotropic metallic body.

4,388,125

CARBURIZATION RESISTANT HIGH TEMPERATURE ALLOY

Raymond C. Benn, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Jan. 13, 1981, Ser. No. 224,800

Int. Cl.³ C22C *19/05*

U.S. Cl. 148—428 **26 Claims**

1. A nickel-base heat resistant alloy consisting essentially of, by weight, chromium, from about 28 to about 35%; iron, from about 10 to about 22%; titanium, from about 0.1 to about 0.7%; carbon, from about 0.2 to about 0.75%; manganese, from about 0.5 to about 2%; calcium, present up to about 0.04%; tungsten, from about 0.5 to about 5%; aluminum, from about 2 to about 2.5%; silicon, from about 0.4 to about 2%; and nickel, the balance, said alloy being characterized by a microstructure containing titanium-rich carbonitride particles.

4,388,126

MULTI-COMPONENT PROPELLANT CHARGES

Craig Johnson, Indian Head, Md.; Paul Dendor, Alexandria, Va., and Harry L. Hodgkins, Upper Marlboro, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 22, 1980, Ser. No. 189,428

Int. Cl.³ C06B *45/12*

U.S. Cl. 149—14 **14 Claims**

1. A multi-component propellant charge for a gun launched rocket comprising

(1) a high-energy fuel-rich thrust propellant component forming the forward portion of the propellant charge; and

(2) an high-strength energetic support component forming the rear portion of the propellant charge and comprising

(a) from 55 to 75 weight percent of an oxidizer; and

(b) a binder which is the reaction product of

(i) from 5 to 8 weight percent of a polyalkene glycol having an average molecular weight of from 150 to 500;

(ii) from 2 to 5 weight percent of a trifunctional cross-linking agent capable of reacting with diisocyanates and

(iii) from 4 to 10 weight percent of a di-isocyanate; and

(c) from more than zero to 20 weight percent of an energetic plasticizer;

said weight percents being based on the total weight of the high-strength energetic support component;

and said high-strength energetic support component comprising from 5 to 15 percent of the length of the multi-component propellant charge.

4,388,127

METHOD FOR WRAPPING THREE-DIMENSIONALLY CURVED CONDUCTORS

Karl Brunner, Schwabach; Hans Barking, Dinslaken, and Günter Didschies, Nürnberg-Boxdorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

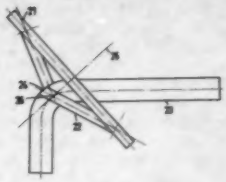
Filed Jun. 11, 1981, Ser. No. 272,475

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1980, 3022303

Int. Cl.³ H01B *13/08*

U.S. Cl. 156—53 **3 Claims**

1. A method for wrapping a three-dimensionally curved conductor with insulating tape by using a wrapping device having a wrapping ring provided with at least one tiltable supply roll of tape, the tape being guided along a curved conductor, the wrapping ring having freedom of movement in six directions, and an axis of rotation, the method comprising the



step of moving the wrapping ring so that its axis of rotation is always located at a spinning point of the tape, said spinning point of the tape being located where the tape tangentially contacts the conductor.

4,388,128

SOLID-STATE COLOR-IMAGE SENSOR AND PROCESS FOR FABRICATING THE SAME

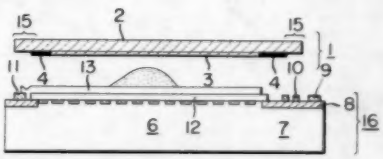
Kazufumi Ogawa; Shigeru Kondo, both of Hirakata; Yoshiko Yasuda, Sakai; Taketoshi Yonezawa, Ibaraki, and Isamu Kitahiro, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 11, 1981, Ser. No. 242,578

Claims priority, application Japan, Mar. 17, 1980, 55/33805; Mar. 19, 1980, 55/35291

Int. Cl.³ B29C *27/10*; B32B *31/20*; H01L *31/18*

U.S. Cl. 156—64 **4 Claims**



1. A process for fabricating solid-state color-image sensors, comprising the steps of:

(a) placing an adhesive agent which is curable not only by ultraviolet-ray irradiation but also by heating between a picture-element grid on a solid-state image sensor chip and a filter pattern on an optical glass substrate of a color filter and pressing said solid-state image sensor chip and said color filter against each other,

(b) aligning the filter pattern on said color filter with the picture-element grid on said solid-state image sensor chip while said color filter and said sensor chip are pressed against each other,

(c) thereafter, curing a predetermined portion or portions of the adhesive by ultraviolet-ray irradiation,

(d) removing the uncured unwanted adhesive which oozes out around the edges of said color filter and sensor chip, and

(e) curing the adhesive which has remained uncured after the curing step by ultraviolet-ray irradiation, by heating.

4,388,129

PRODUCTION OF BUBBLE-FREE ELECTRICAL LAMINATES

Masayuki Oizumi, Ohtsu; Masaharu Abe, Kobe, and Yasuo Fushiki, Takatsuki, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 22, 1981, Ser. No. 304,692

Claims priority, application Japan, Sep. 22, 1980, 55-132158; Sep. 25, 1980, 55-134013

Int. Cl.³ B32B *31/14*

U.S. Cl. 156—73.1 10 Claims

1. A process for producing bubble-free electrical laminates which comprises the steps of impregnating a porous fibrous substrate with a solvent-free, liquid resin capable of curing to a rigid state without producing a volatile by-product combining a plurality of impregnated substrates to form a green laminate, allowing said green laminate to stand prior to the curing step for a sufficient length of time and applying ultrasonic waves thereto to dissolve substantially all of the entrapped air bubbles into said liquid resin phase, and then curing the green laminate.

4,388,130

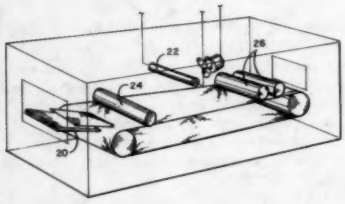
METHOD OF PRODUCING A PACKAGE FOR DISPLAY AND HANDLING OF FOIL ART

F. Jeffery Bautze, 136 Lakeshore Dr., Marlboro, Mass. 01752

Division of Ser. No. 174,497, Aug. 1, 1980, abandoned. This application Dec. 2, 1981, Ser. No. 326,768

Int. Cl.³ B29C *27/20*

U.S. Cl. 156—85 1 Claim



1. The method of producing an improved package for the display and handling of foil art comprising the steps of:

determining the size of said foil art;

providing a backboard longer and wider than the size of said foil art said backboard having a thickness of at least 14 ply;

positioning said foil art and said backboard, leaving margins around all the sides of said foil art;

adhering said foil art to said backboard by adhesive;

providing a mat of the same size as said backboard, said mat having an aperture centrally defined therein slightly smaller than the size of said foil art;

positioning said mat over said backboard so that said aperture is above said foil art with a portion of said mat covering the edges of said foil art;

adhering said mat to said backboard;

providing a stiff plastic film of at least 10 mils in thickness of the approximate size of said backboard;

positioning said plastic film to contact said mat above said foil art;

putting said resulting backboard, foil art, mat, and stiff plastic film sandwich provided above into an approximately 75 gauge shrinkwrap envelope of clear chemically-compatible material; to said stiff plastic film;

sealing the edges of said shrinkwrap;

positioning the resulting shrinkwrap covered package on a ledge in a heat tunnel;

heating lightly said shrinkwrap causing slow shrinkage of said wrap;

rolling said sandwich package under a first hot roller to remove the air from therein;

heating said shrinkwrapping to cause said shrinkwrapping to shrink tightly around said sandwich package; and

rolling said sandwich package under a second hot roller to iron any wrinkles remaining in said shrinkwrap.

providing a mat of the same size as said backboard having an aperture defined therein of the approximate size of said foil art;

adhering said mat to said backboard so that said aperture is above said foil art; and

positioning said plastic film to contact said mat above said foil art.

4,388,131

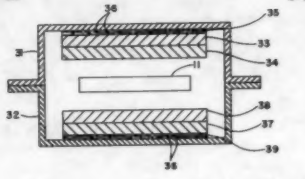
METHOD OF FABRICATING MAGNETS

John C. Unger, San Diego; Sidney J. Schwartz, Vista, and Ling G. Chow, San Diego, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 70,238, Aug. 27, 1979, abandoned, which is a continuation of Ser. No. 792,577, May 2, 1977, abandoned. This application Dec. 22, 1980, Ser. No. 218,866

Int. Cl.³ B32B *31/18;* B42C *15/00*

U.S. Cl. 156—89 7 Claims



1. An improved method of fabricating a multi-layer magnet structure comprising the steps:

forming a first slurry of a first ferrite including certain first oxide additives and casting a first tape therefrom;

forming at least one other slurry of at least one other chemically different ferrite including certain second oxide additives, at least some which are chemically different from said first oxide additives, and casting an associated tape from each such other slurry;

cutting strips of prescribed common length and width from each said tape and forming a laminate with the tapes laid-up in prescribed order superposed and pressed together intimately; and

heating, and cofiring this laminate to cure the tapes and leave them adhered to one another; the slurry consistancy, pressure and heating values being selected to assure that there is sufficient inter-diffusion between the tapes that they may be so co-fired to form an integral magnet with no magnetically-significant air gap between the tapes.

4,388,132

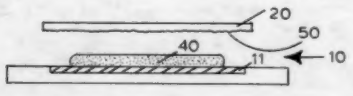
METHOD OF ATTACHING A PROTECTIVE FILM TO AN INTEGRATED CIRCUIT

Carl E. Hoge, Encinitas, and Gregory K. Lin, San Diego, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 1, 1981, Ser. No. 268,813

Int. Cl.³ B32B *31/12, 7/12*

U.S. Cl. 156—153 10 Claims



1. A method of attaching a protective film to a planar surface

of an integrated circuit; said film having a perimeter with edges that correspond to and precisely overlie other edges along the perimeter of said planar surface of said integrated circuit when said film and said circuit are in alignment with each other; said method including the steps of:

disposing an adhesive in a fluid phase between said surface of said circuit and the surface of said film such that said corresponding edges are in an offset position from each other;

moving said film, by the surface tension of said fluid adhesive between said surfaces and without any manual or mechanical pressing, from said offset position to another position where said corresponding edges align with each other; and

hardening said adhesive subsequent to said moving step.

4,388,133

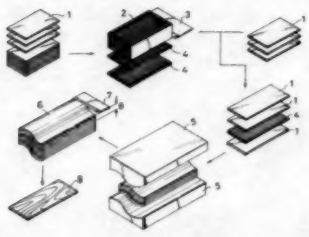
METHOD OF MANUFACTURING ARTIFICIAL WOOD VENEER

Shozo Hirao, Shuita; Yasuhiro Saihara, Kadoma; Toshio Nakanishi, Okazaki; Ichiro Ihara, Okazaki, and Yoshio Sano, Okazaki, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Dec. 2, 1981, Ser. No. 326,618

Int. Cl.³ B29C *19/00*

U.S. Cl. 156—245 **35 Claims**



30. A method of manufacturing artificial veneers comprising the steps of preparing at least two different kinds of material veneers cut out of different natural woods, forming at least three different kinds of first artificial flitches by collecting under a pressure a plurality of said material veneers heaped up with a binder interposed between them, forming at least three different kinds of collected veneers by slicing respective said first artificial flitches in a straight grain direction by a cutting edge oriented transversely of the planes of said material veneers, forming a composite veneer by combining and joining one of said different kinds of collected veneers and material veneer with said binder interposed between them, forming a second artificial flitch by assembling into a set with composite veneer with said composite collected veneer with the collected veneer in the composite veneer arranged adjacent the composite collected veneers and by collecting under a pressure a plurality of said assembled sets alternately heaped up with said binder interposed between them, and slicing said second artificial flitch in a flowered grain direction.

4,388,134

UNDERWATER DIVER'S DRY SUIT AND METHOD OF SEALING

Richard W. Long, and Robert T. Stinton, both of San Diego, Calif., assignors to Diving Unlimited International, Inc., San Diego, Calif.

Filed Apr. 28, 1982, Ser. No. 372,625

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—248 **9 Claims**

1. The method of forming a watertight dry suit for underwater divers, said suit consisting of sections of foam core material laminated on both sides with a cover material, said sections being stitched together, including the steps of:

(1) removing a portion of the cover material on the inside of the suit along a seam to expose the foam core without destroying it;

(2) coating the exposed foam material with an adhesive;

(3) placing a sealing strip of said cover material with foam on one side over the adhesive, with the foam side of the sealing strip in contact with the adhesive to foam a secure foam to foam seal at the seam.

4,388,135

METHOD OF MANUFACTURING OSTOMY POUCHES

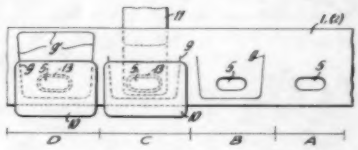
Ole R. Jensen, River Vale, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 24, 1981, Ser. No. 286,495

Claims priority, application Denmark, Aug. 1, 1980, 3328/80

Int. Cl.³ B32B *31/18, 31/20*

U.S. Cl. 156—250 **4 Claims**



1. A method of manufacturing ostomy pouches having an adhesive label or faceplate that attaches the pouch to the body comprising;

(a) advancing two superposed webs of weldable plastics sheet material and producing an aperture only in the uppermost web;

(b) welding said two webs to form a partial pouch contour said partial contour extending from the top edge of the pouch past the area of said aperture in said uppermost web;

(c) inserting a separator member into the partially contour welded pouch to function as a base for said uppermost pouch wall;

(d) welding or bonding an adhesive label or faceplate to said supported uppermost pouch wall around said aperture;

(e) removing said separator member; and

(f) completing the contour welding of said pouch walls so as to form a completed pouch of desired configuration.

4,388,136

METHOD OF MAKING A POLYIMIDE/GLASS HYBRID PRINTED CIRCUIT BOARD

Jaken Y. Huie, Apple Valley, Minn., and Dan Jacobus, Glendale, Wis., assignors to Sperry Corporation, New York, N.Y.

Filed Sep. 26, 1980, Ser. No. 191,651

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—252 **2 Claims**

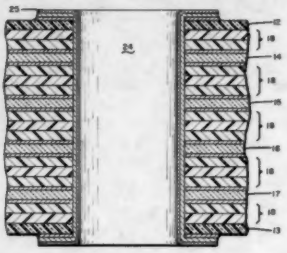
1. A method of fabricating a hybrid multilayer printed circuit board comprising:

trimming to rough size a plurality of double-copper-clad epoxy-glass-base boards;

forming circuit patterns in the top and bottom copper layers of said epoxy-glass-base boards;

trimming to rough size two single-copper-clad polyimide-glass-base boards:

forming a pre-laminated structure by sandwiching said plurality of said epoxy-glass-base boards between said two polyimide-glass-base boards with the copper layers thereon exposed and with one or more layers of B stage prepreg containing an epoxy resin inserted between each of said sandwiched and said sandwiching boards;



forming a laminated structure of said pre-laminated structure by applying pressure and heat thereto;

forming through-holes in said laminated structure;

forming circuit patterns in the copper layers of said polyimide-glass-base boards; and,

trimming said laminated structure to final size.

4,388,137

PROCESS FOR TRANSFER COATING WITH RADIATION-CURABLE COMPOSITIONS

William H. McCarty, Whitehouse Station; John P. Guarino, Lawrenceville, and Frank A. Nagy, Edison, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 967,189, Dec. 7, 1978, abandoned. This application Jul. 31, 1980, Ser. No. 174,057

Int. Cl.³ B29C *19/02*

U.S. Cl. 156—275.5 **14 Claims**

1. A process for applying a coating to a thin porous substrate and reducing absorption of said coating into said substrate, said process comprising:

(a) applying a radiation-curable composition to a carrying web; said radiation-curable coating composition having a crosslink density of 0.11 to about 1.0 determined by calculation of the gram moles of branch points per 100 grams of uncured coating; a glass transition temperature of the radiation cured coating within the approximate range of −20° C. to 50° C.; and containing internal lubricant incorporated therein in an amount sufficient to facilitate removal of the cured coating from a carrying web substrate without adversely affecting adhesion of the cured coating to said solid substrate; said carrying web being of a nature such that said coating composition, when cured, will not adhere to its surface;

(b) bringing a thin porous substrate to which said coating composition will adhere into contact with said coating composition on said carrying web to form a sandwich;

(c) subjecting said sandwich to a radiation curing process wherein said coating composition is polymerized and set on the surface on said porous substrate; and

(d) stripping said carrying web away from the layer comprising said cured coating composition.

4,388,138

PREPARING PARTICLEBOARD UTILIZING A VEGETABLE WAX OR DERIVATIVE AND POLYISOCYANATE AS A RELEASE AGENT ON METAL PRESS PARTS

James P. Brown, Manchester; Graham Gibbins, Lancashire, and Robert S. Hampson, Oldham, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 3, 1981, Ser. No. 289,733

Claims priority, application United Kingdom, Aug. 11, 1980, 8026057

Int. Cl.³ B32B *21/02*; **C08L** *91/06*

U.S. Cl. 156—289 **8 Claims**

1. A process for the continuous manufacture of sheets or moulded bodies which comprises hot pressing a ligno-cellulosic material in contact with an aqueous dispersion of an organic polyisocyanate and a wax release agent which is selected from the group consisting of a vegetable wax and a modified vegetable oil, said wax release agent having a melting point of at least 70° C. whereby there is achieved release of successive batches of said ligno-cellulosic material from metal parts of the press with which it comes into contact during hot pressing.

4,388,139

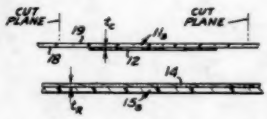
THERMOSENSING ARTICLE AND METHOD OF MANUFACTURE

David L. Fuller, 1110 Mountain Creek Trail, NW., Atlanta, Ga. 30328

Filed Jul. 14, 1980, Ser. No. 168,014

Int. Cl.³ C09J *5/02*

U.S. Cl. 156—307.5 **6 Claims**



1. A method of fabricating a strip thermometer comprising the steps of:

applying to a first substrate a plurality of cholesteric liquid crystal compositions exhibiting color changes with different temperature responsive ranges that each such composition so applied is spaced from the other such compositions so applied and where the liquid crystal compositions are sufficiently viscous to flow under pressure;

coating a second substrate with an uncured solid film forming epoxy resin composition, which absorbs the liquid crystal compositions while in the uncured state;

partially curing the epoxy resin composition coating on the second substrate while maintaining the epoxy resin coating separated from the cholesteric liquid crystal compositions until the epoxy resin composition reaches a non-absorbing partially cured state in which the cholesteric liquid crystal compositions will not be absorbed by the epoxy resin composition;

placing the first and second substrates together so that the partially cured epoxy resin composition overlies all of the cholesteric liquid crystal compositions on the first substrate while the epoxy resin composition is in the non-absorbing partially cured state;

with the partially cured epoxy resin composition overlying the cholesteric liquid crystal compositions, forcing the first and second substrates toward each other while the epoxy resin composition has sufficient fluidity to flow around the cholesteric liquid crystal compositions without

substantially distorting the cholesteric liquid crystal compositions to cause the partially cured epoxy resin composition to flow around the cholesteric liquid crystal compositions and into contact with the first substrate between the cholesteric liquid crystal compositions so that the epoxy resin composition adheres to the first substrate and confines the cholesteric liquid crystal compositions between the epoxy resin composition and the first substrate; and

subsequently, finishing the curing of the epoxy resin compound to bond the epoxy resin composition to the first substrate.

4,388,140

APPARATUS FOR WET TREATMENT OF WAFER MATERIALS

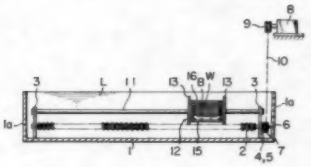
Yasuaki Nakazato, Koshoku; Yasushi Miyazaki, Nagano; Makoto Osuga, Nagano, and Masao Kodaira, Nagano, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1981, Ser. No. 279,314

Claims priority, application Japan, Jul. 15, 1980, 55-99634[U]

Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—345 **1 Claim**



1. An apparatus for the wet treatment of wafer materials with a treatment liquid which comprises

(a) a liquid tub for containing the treatment liquid,

(b) a pair of screw shafts threaded in the same pitch and held horizontally in the liquid tub in parallel with each other in a rotatable manner in the same direction at the same velocity,

(c) a traveling drum carriage having two circular end plates for holding a wafer basket containing a plural number of wafer materials, said carriage being mountable on the pair of the screw shafts axially in parallel therewith and engaged at the end plates with the threads of the screw shafts so as to be transferred from one end of the pair of the screw shafts to the other with simultaneous axial rotation by the rotation of the screw shafts and demountable therefrom, and

(d) a means for rotating the screw shafts in the same direction.

4,388,141

APPARATUS FOR FUSING STRIPS

Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Co., San Francisco, Calif.

Division of Ser. No. 79,977, Sep. 28, 1977, Pat. No. 4,259,131. This application Dec. 3, 1980, Ser. No. 212,352

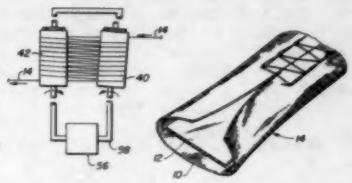
Int. Cl.³ B32B *31/00*; B65C *1/00*; D04F *61/00*

U.S. Cl. 156—432 **2 Claims**

1. Apparatus for heat fusing a flat strip of a first material to a flat strip of a second material which has a melting point lower than the scorching point of the first material, and wherein at least one of the two strips is continuous, the apparatus comprising:

a pair of side-by-side drums which counter-rotate about non-parallel axes of rotation, each drum having a smooth, cylindrical, outer surface upon which the flat strips of material can be wound in contact with each other in a plurality of figure eight wrappings and wherein at least one of the drums is comprised of a first cylinder and a second cylinder mounted concentrically within the first cylinder to form a hollow, cylindrically shaped space therebetween;

means for heating the cylindrical, outer surfaces of the drums to the melting point of the second material, including means for circulating a hot fluid longitudinally through the annular space between the first and second



cylinders whereby the temperature drop along the length of the outer surface of the first cylinder is minimized, and

adjustable means for counter-rotating the drums at a selected speed whereby the strips travel back and forth over portions of the cylindrical, outer surface of each drum for a predetermined period of time selected to ensure fusing of the strip of the second material into the strip of the first material.

4,388,142

ELECTRICAL HARNESS FORMING MACHINE

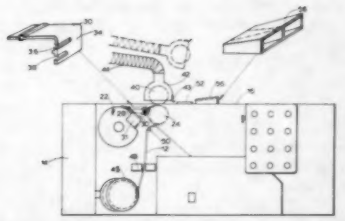
Gaetan Hembert, Marck, France, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 9, 1980, Ser. No. 214,770

Claims priority, application United Kingdom, Dec. 20, 1979, 7943840

Int. Cl.³ B65C *1/00*

U.S. Cl. 156—446 **7 Claims**



1. A harness-forming machine for use in forming an electrical wiring harness in the form of a tape by securing together side-by-side a plurality of leads which have terminal fittings pre-fitted at least on the leading ends thereof, the machine comprising activating means comprising a hot-air blower operable to direct hot air at bonding material drawn therepast to cause it to assume a potentially bond-forming condition, combining means comprising opposed rollers providing a roll nip arranged to bring together the leads and the bonding material, in its potentially bond-forming condition, into a required tape form as the leads and the bonding material are drawn therethrough after the bonding material has been drawn past said hot-air blower, and lead drawing means arranged to cause the leads, and the bonding material therewith, to be drawn through the combining means and the harness so formed to be wound up into the form of a coil, said drawing means comprising winding means comprising lead holding means mounted on a winding drum, said lead holding means being arranged to engage the terminal fittings on the leading ends of the leads in order that the winding means can wind up the harness on the

drum, one of said opposed rollers of the combining meand being mounted for movement away from the other to permit the introduction of leads therebetween when setting up the machine to form a harness, and said hot-air blower being mounted for movement between an operative position and an inoperative position to which it can be moved when not required in its operative position during formation of a harness.

4,388,143

METHOD AND APPARATUS FOR AFFIXING STRIP LABELS TO CONTAINER CLOSURES

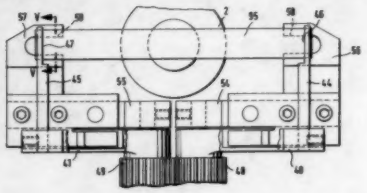
Rainer Buchholz, Düsseldorf; Hans-Werner Mohn, Kaarst; Hermann Boms, Ratingen, and Rudolf Zodrow, Düsseldorf, all of Fed. Rep. of Germany, assignors to Jagenberg-Werke AG, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 2, 1981, Ser. No. 317,682

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 3041057

Int. Cl.³ B65C *1/00*

U.S. Cl. 156—475 **36 Claims**



1. An apparatus for affixing strip labels to container closures, comprising a transfer mechanism for strip labels, an applicator adapted to advance toward two opposite sides of a container to be labeled and to press the label onto the container, two gripping members for picking up a strip label from the transfer mechanism, said gripping members being adapted to grasp the ends of the strip label when said ends are held by the transfer mechanism over the container, and means for pivoting said gripping members while grasping said strip label ends to carry said gripping members from pickup positions over paths which are in the same plane as the axis of the container into a transfer position at the sides of the container.

4,388,144

RAPID-CYCLE PRESS

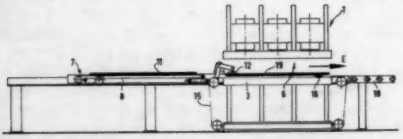
Heinrich Wemhöner, Herford, Fed. Rep. of Germany, assignor to Heinrich Wemhöner GmbH & Co. KG, Herford, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 245,113

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1980, 3031683

Int. Cl.³ B30B *1/00*; B32K *31/00*; B23K *27/00*

U.S. Cl. 156—538 **7 Claims**



1. In a press for coating sheets, panels and similar workpieces, a combination comprising an upper and a lower press plate one of which is mounted for vertical movement relative to the other between a pressing position and a workpiece feeding and removing position in which the plates form with one another a gap; lifting means comprising a suction member for engaging an edge portion of a finished workpiece resting on the lower press plate such that when the one plate is in said removing position the said lifting means lifts such edge portion; means for inserting at least one supporting bar at said lifted edge portion underneath the workpiece; means for removing the workpiece supported on said bar, from said gap; means mounting said lifting means for horizontal movement relative to said gap; and means for feeding workpieces into the gap and having a carriage; said mounting means being located on said carriage; said lifting means and said supporting bar comprising a combination for cooperatively removing a finished workpiece.

4,388,145

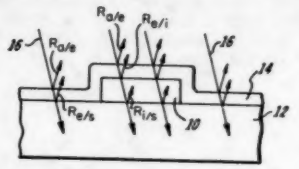
LASER ANNEALING FOR GROWTH OF SINGLE CRYSTAL SEMICONDUCTOR AREAS

William G. Hawkins, and Jerry G. Black, both of West Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1981, Ser. No. 316,210

Int. Cl.³ C30B *13/06*

U.S. Cl. 156—617 R **11 Claims**



1. A method for converting predefined areas of semiconductor material into single crystal areas, characterized by including the steps of:

providing support means in the form of a material being highly absorptive of the wavelength of a projected optical energy source and having a first refractive index;

providing an array of crystallizable semiconductor areas upon said support means, said areas being in the form of a material subtantially transparent to the wavelength of a projected optical energy source and having a second refractive index;

projecting an optical energy source upon each semiconductor area and a portion of the support surrounding each area;

reflecting more incident optical energy in the region of said substrate directly beneath said areas than in the region of said substrate surrounding said areas;

heating the substrate with said optical energy source, such that the region of said substrate surrounding said areas is made hotter than the region of said substrate directly beneath said areas, while leaving said areas substantially unheated thereby;

removing said optical energy source;

melting said areas by heating them from said heated substrate; and

cooling said melted areas and said substrate such that during cooling a concave thermal gradient exists across said areas with the center of each of said areas being cooler than its edges and said areas recrystallize as single crystals.

4,388,146

ANALOG CORRECTION OF QUARTZ RESONATOR ANGLE OF CUT

Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 25, 1982, Ser. No. 361,655

Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*

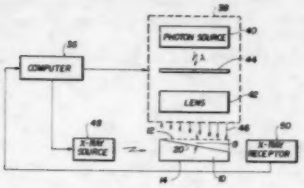
U.S. Cl. 156—626 **18 Claims**

1. The method of correcting the angle of cut of a quartz crystal resonator blank including at least one major face treated with a photolytic etchant and which substantially

eliminates the need for forming a mesa and subsequent machine lapping thereof to provide an inclined corrected angle surface on said blank, comprising the steps of:

(a) locating an uncorrected resonator blank in etching apparatus;

(b) generating a photon energy source; and



(c) directing photon energy from said source to said major face and generating an intensity gradient of photon energy across the surface of said major face causing a gradient of surface erosion to occur by photolytic etching which thereby changes the angle of cut of said resonator blank.

4,388,147

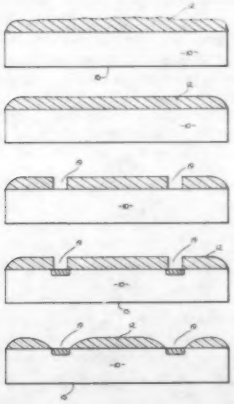
METHOD FOR STEAM LEACHING PHOSPHORUS FROM PHOSPHOSILICATE GLASS DURING SEMICONDUCTOR FABRICATION

Paul R. Engel, Aloha, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Aug. 16, 1982, Ser. No. 408,711

Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—646 **13 Claims**



1. A process for reducing the phosphorus concentration in a phosphosilicate glass, comprising the steps of:

providing a steam environment;

adjusting the temperature of said environment, such that said temperature lies within a predetermined range;

adjusting the pressure within said environment, such that said pressure lies within a predetermined range;

inserting said phosphosilicate glass into said environment;

removing said glass from said environment once a desired amount of phosphorus has been leached from said glass;

whereby the concentration of phosphorus in said glass is reduced.

4,388,148

PROCESS FOR PRODUCING PULP

Richard A. Yahrmarkt, Batavia, Ill., and Michael J. Stanbrough, Benicia, Calif., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jun. 23, 1981, Ser. No. 276,714

Int. Cl.³ D21B *1/16*

U.S. Cl. 162—26 **9 Claims**

1. A process for mechanically refining pulp, comprising:

adding from about one pound to about seven pounds of alkaline salt of aluminate per dry ton of end product pulp to pulp material to reduce energy consumption during mechanical refining; and

mechanically refining said pulp material at a pH of from about 7.5 to about 8.5 in the presence of said alkaline salt of aluminate.

4,388,149

TITANIUM COATED ASBESTOS FIBER

Frank M. Kimmerle, and Pierre Roberge, both of Sherbrooke, Canada, assignors to Societe Nationale de L'Amiante, Quebec, Canada

Filed Oct. 13, 1981, Ser. No. 310,722

Int. Cl.³ D21H *5/18*

U.S. Cl. 162—153 **6 Claims**

1. A chrysotile asbestos fiber substantially coated on its exterior surface with hydrated titanium dioxide, the titanium dioxide content being from 0.5 to 35% by weight, part of the titanium dioxide being chemically bonded to the asbestos fiber and the remaining titanium dioxide being retained by electrostatic bond, said modified fiber having an Mg:Si ratio of from less than 3:2 to 2:2 when calculated on an atomic number ratio, a Ti:Si ratio of from more than 0.2 to less than 1:2 and said modified fiber being also characterized by an infrared spectrum wherein the relative peaks at 1082, 1025 and 957 cm^{-1} have been substantially altered in their intensity as compared to unmodified, natural asbestos fibers, said fiber resisting leaching of the Mg ions by strong acids 3 to 6 times better than unmodified, natural asbestos fibers and resisting leaching of SiO_2 groups in strong alkali media 1.5 to 3 times better than unmodified, natural chrysotile fibers.

2. A method for chemically bonding titanium dioxide to asbestos fibers which comprises

(a) forming a slurry of opened asbestos fibers by dispersing asbestors fibers in deoxygenated water;

(b) contacting said slurry in the absence of oxygen with a solution of trivalent titanium salt having a pH of less than 5 thereby to causing oxidation of the Ti^{+++} ions to Ti^{++++} ions by water catalyzed by the surface of the asbestos fibers, said step (b) resulting in the formation and bonding to the asbestos fibers of titanium dioxide.

4,388,150

PAPERMAKING AND PRODUCTS MADE THEREBY

Olof Sunden, Thonon, France; Per G. Batelson, Lilla Edet, Sweden; Hans E. Johansson, Kungälv, Sweden; Hans M. Larsson, and Per J. Svending, both of Gothenburg, Sweden, assignors to Eka Aktiebolag, Surte, Sweden

Filed Feb. 26, 1981, Ser. No. 238,635

Claims priority, application Sweden, May 28, 1980, 8003948

Int. Cl.³ D21H *3/28, 3/66*

U.S. Cl. 162—175 **37 Claims**

1. In a paper making process in which an aqueous papermaking stock containing a sufficient amount of cellulosic pulp to give a finished paper containing at least 50% cellulosic fiber is formed and dried, the improvement which comprises providing in the stock prior to the formation of the sheet a binder comprising colloidal silicic acid having an average particle size of less than 20 nm, and cationic starch having a degree of substitution of not less than 0.01, the weight ratio of cationic starch to SiO_2 being between 1:1 and 25:1, the solids in said binder amounting to 0.1–15% of the weight of said pulp, said

cationic starch and said colloidal silicic acid being admixed with each other in the presence of cellulosic fiber to form a complex of cationic starch and colloidal silicic acid which serves as a binder for the cellulosic fibers.

4,388,151

METHOD AND DEVICE FOR FEEDING PURGING AND DEGRAPHITIZING AIR INTO COKE OVENS

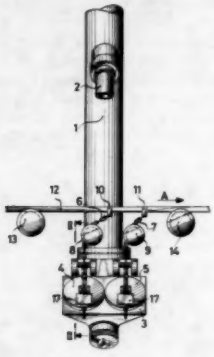
Rainer Küppenbender, Ratingen, Fed. Rep. of Germany, assignor to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,167

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1980, 3031329

Int. Cl.³ C10B *5/02, 21/04, 43/10*

U.S. Cl. 201—2 **9 Claims**



1. A device for feeding purging and degraphitizing air into coke ovens with heating walls, comprising:

a pipe for rich gas leading to each of the heating walls;

a first gate;

a first cross-sectional opening connected to the pipe for rich gas arranged and constructed to be opened and closed with the first gate and having a relatively small cross-sectional aperture for passing purging air therethrough;

a second gate;

a second cross-sectional opening connected to the pipe for rich gas arranged and constructed to be opened and closed with the second gate and having a relatively large cross-section for passing degraphitizing air therethrough; and

wherein said gates and openings are arranged and constructed such that purging air flows through said first cross-sectional opening before degraphitizing air flows through said second cross-sectional opening.

4,388,152

PROCESS FOR PRODUCING BLAST FURNACE GRADE COKE, A DISTILLABLE PRODUCT AND FUEL GASES FROM A HEAVY, HIGH SULFUR, CRUDE OIL

George E. Wasson, Eighty Four; Frank W. Theodore, Pittsburgh, both of Pa.; Lyndon D. Boyer, and Matthew C. Sooter, both of Ponca City, Okla., assignors to Conoco Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 174,981, Aug. 4, 1980, abandoned. This application Jan. 21, 1982, Ser. No. 341,381

Int. Cl.³ C10B *49/06, 55/06, 57/02*

U.S. Cl. 201—6 **11 Claims**

1. A process for producing a distillable hydrocarbonaceous product and a high strength coke briquette product suitable for use as blast furnace coke from a heavy high-sulfur crude oil, said process comprising:

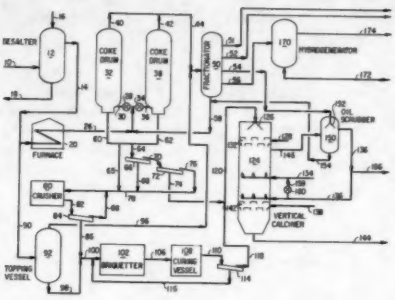
(a) feeding said heavy crude oil having 4 or more weight percent sulfur, to a delayed coking drum at conditions of temperature and pressure to thermally decompose said crude oil to produce a mass of solid coke in said coking drum and a distillable stream recovered as a vaporous stream at a temperature above about 830° F. (445° C.) from said coking drum;

(b) grinding at least a portion of said coke to produce finely-divided coke of a size less than about 6 Tyler Mesh;

(c) mixing a suitable binder with said finely-divided coke in suitable proportions to produce a briquettable mixture;

(d) briquetting said briquettable mixture to produce briquettes;

(e) heating said briquettes to calcining temperatures at a rate of not more than 5° F. per minute within the range of from about 600° F. to about 1500° F.;



(f) calcining said briquettes in a vertical calciner at a temperature from about 2000° to about 2950° F. (about 1090° to about 1625° C.) for a time sufficient to substantially reduce the sulfur content of said briquettes;

(g) recovering a calcined product of a size from about ¾ inch to about 3 inches having a sulfur content less than 1.0 percent by weight and a hardness factor of 60 or greater and a stability factor of 39 or greater, suitable for use as a blast furnace grade coke and a vaporous hydrocarbonaceous stream from said vertical calciner; and

(h) passing said vaporous stream from said coking drum and said vaporous stream from said vertical calciner to further processing as a distillable hydrocarbonaceous product stream.

4,388,153

COKE SPILLAGE REMOVAL DEVICE

Gilbert Blair, Coraopolis, Pa., and Martin C. Dusel, Indianapolis, Ind., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1981, Ser. No. 323,182

Int. Cl.³ C10B *25/14, 33/14, 45/00*

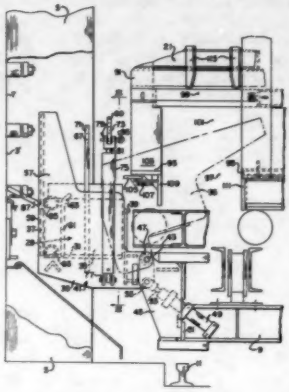
U.S. Cl. 202—248 **13 Claims**

1. A coke oven battery servicing apparatus for catching and collecting coke discharged from the oven during door removal and conveying the collected discharged coke together with the coke pushed from the oven, from the face of the oven to a quenching receptacle, across a coke side servicing car disposed therebetween, comprising:

coke guide cage means having a first end and a second end and a generally horizontally disposed planar floor member extending therebetween, said planar floor member having an opening therein proximate said first end, said coke guide means being mounted on said servicing car for selective movement at least from a position in which said first end is spaced from the oven face for door removal to a position in which said first end is adjacent a selected oven; and

coke catching means having a generally planar bottom member which is complementary to the opening in said coke guide floor member, said coke catching means being mounted on said servicing car for selective movement

from at least a first position in which said coke catching means is disposed below and adjacent the selected oven during door removal to catch and collect discharged coke, to a second position in which said planar bottom member is removably inserted into the opening in said



coke guide floor member and together with said floor member defines a generally continuous planar surface on which the discharged coke together with the coke remaining in the oven is conveyed to the quenching receptacle when said first end of said coke guide is adjacent the selected oven.

4,388,154

ISOLATION OF ACETALDEHYDE AND METHANOL FROM REACTION MIXTURES RESULTING FROM THE HOMOLOGIZATION OF METHANOL

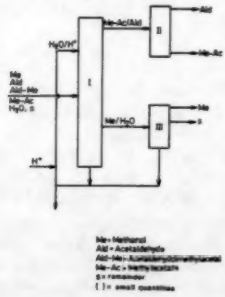
Waldheim Hochstein, Freinsheim; Gerd Kaibel, Lampertheim; Franz-Josef Mueller, Wachenheim, and Horst Hartmann, Boehl-Iggelheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 1, 1981, Ser. No. 259,655

Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019765

Int. Cl.³ B01D *3/14*

U.S. Cl. 203—35 **7 Claims**



1. A process for isolating acetaldehyde and methanol from a reaction mixture which results from the homologization of methanol and which in addition to acetaldehyde essentially contains acetaldehyde dimethylacetal, methanol, methyl acetate and water, which process comprises:

(a) introducing the reaction mixture into the middle zone of a column I, at a temperature at which the methyl acetate and its azeotropic mixture with methanol vaporize completely, but the methanol does not,

(b_1) feeding a liquid aqueous acid into the upper quarter of the column I in counter-current to the rising vapors to cause cleavage of the acetaldehyde-dimethylacetal into acetaldehyde and methanol, or

(b_2) in place of step (b_1), feeding water alone into the upper quarter of the column I in counter-current to the rising vapors in the presence of a solid acidic ion exchanger to effect the acetal cleavage,

(c) taking off a vapor mixture of methyl acetate and acetaldehyde at the top of column I and separating the mixture into its components in a column II,

(d) in the lower quarter of column I, taking off a liquid mixture of methanol and water and separating the mixture into its components in a column III, and

(e) removing a part of the aqueous acid (embodiment b_1) or of the water (embodiment b_2) arising in the bottom of column I, together with minor amounts of other products, from the system, and combining the remainder of this aqueous acid or of this water with the water forming in the bottom of column III and recycling the combined aqueous solution, after mixing with an acid, into the upper quarter of column I.

4,388,155

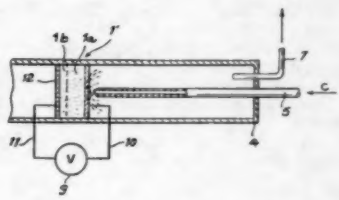
SOLID SENSOR FOR ANHYDRIDES

Andre M. Chamberland, Mont St-Hilaire, and Michel Gauthier, Laprairie, both of Canada, assignors to Hydro-Quebec, Montreal, Canada

Division of Ser. No. 718,511, Aug. 30, 1976, Pat. No. 4,282,078, and a continuation-in-part of Ser. No. 472,904, May 23, 1974, abandoned. This application Jul. 31, 1980, Ser. No. 174,186

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—1 T **2 Claims**



1. A method for measuring the activity of gaseous anhydrides in an oxygen-bearing gas comprising the steps of:

(a) providing a solid state electrolyte element having oxy-anions of the element forming the anhydride to be detected, said electrolyte element comprising one part made of an alkali metal salt or an alkaline earth metal salt supplying said oxy-anions and another part made of a mixture of said salt and of a metal salt; a detection electrode in contact with said alkali metal salt or said alkaline earth metal salt for creating a difference of potential when said anhydride to be detected comes into contact therewith and with said oxy-anion containing part of said electrolyte element; said detection and reference electrodes being arranged such that a potential difference occurs between said two elements when a sample of said anhydride to be detected is contacted with said detection electrode, said reference electrode being made of a metal identical to the metal of said metal salt and being in contact with said mixture; means for heating said electrolyte element to a temperature such that a logarithmic variation in concentration of the anhydride to be detected causes a proportional and substantially linear variation in said difference of potential, said temperature being below the fusion temperature of said electrolyte element, and a potentio-

metric measurement means connected to said electrodes for measuring the activity of said anhydride to be detected by measuring said difference of potential;

(b) passing said oxygen-bearing gas containing said anhydride material into contact with said detection electrode and said electrolyte so as to create a potential difference between said two electrodes; and

(c) measuring said potential difference with said potentiometric measurement means to determine the anhydride content of said gas.

4,388,156

ALUMINUM ELECTROLYSIS IN NON-AQUEOUS MONOMERIC ORGANIC ACID

Thomas N. Gillich, Readington Township, Somerset County, and John E. Walls, Annandale, both of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Dec. 23, 1981, Ser. No. 333,586
Int. Cl.³ C25D 9/02
U.S. Cl. 204—14 N 10 Claims

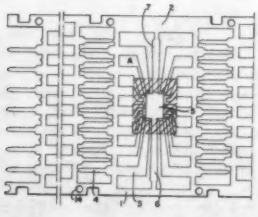
1. A process for treating an aluminum containing sheet substrate which comprises electrolyzing said substrate as an anode in a non-aqueous electrolytic solution comprising a solvent having a dipole moment of at least 1.5 and a compatible monomeric polybasic organic acid, wherein said electrolysis is conducted at a voltage of from about 5 to about 120 volts, with a charge application of from about 1 to about 150 coulombs per square decimeter of substrate, in an electrolyte maintained at a temperature of from about −5° to about 60° C., with a cathode to anode distance of from about 1 to about 25 centimeters.

4,388,157

METHOD OF APPLYING COVERINGS IN THE FORM OF COMPLETELY OR NOT COMPLETELY CLOSED LOOPS

Harry C. Piepers, Eindhoven, Netherlands, assignor to Galentan AG, Zug, Switzerland

Filed Mar. 1, 1982, Ser. No. 353,150
Claims priority, application Netherlands, Mar. 7, 1981, 8101105
Int. Cl.³ C25D 5/02, 17/00
U.S. Cl. 204—15 5 Claims



1. A method of applying continuous or discontinuous loop-like covering to a metal or metallized tape comprising the steps of:

guiding the tape to a first area along the periphery of a wheel;

applying one-half of the said covering at said first area in a first phase of the process;

guiding the tape in a second area along the periphery of the wheel in a direction opposite that in which the tape is guided through the first area along the wheel; and

applying the other one-half of the covering at said second area in a second phase of the process.

4,388,158

ACIDIC TINPLATING PROCESS AND PROCESS FOR PRODUCING AN IRON-TIN ALLOY ON THE SURFACE OF A STEEL SHEET

Tsuneo Inui, Tokuyama; Hitoshi Kuroda, Kudamatsu; Tetsuro Hanabusa, Kudamatsu, and Katsuhito Yazaki, Kudamatsu, all of Japan, assignors to Toyo Kohan Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 92,752, Nov. 9, 1979, abandoned. This application Jun. 25, 1981, Ser. No. 277,162
Claims priority, application Japan, Nov. 27, 1978, 53-145333
Int. Cl.³ C25D 3/32, 5/50, 5/10
U.S. Cl. 204—27 3 Claims

1. A process for producing a steel sheet having 0.05–0.60 g/m² of metallic tin on said steel sheet

which comprises electro-tinplating a steel sheet with an aqueous electrolyte consisting essentially of 5–150 g/l of at least one sulfate selected from the group of sulfates of alkaline metals, ammonium, aluminum, manganese or chromium in a stannous sulfate electrolyte or stannous phenolsulfonate electrolyte consisting of 1.5–50 g/l of stannous ions, 1.0–30 g/l of sulfuric acid or 3.6–106.5 g/l of phenolsulfonic acid, and 1–3 g/l of ethoxylated α-naphthol sulfonic acid and wherein the ratio of said stannous ions to said sulfuric acid or said phenolsulfonic acid is 1–3:1 or 1–3:3.6, respectively.

2. A process for producing a steel sheet having an iron-tin alloy on the surface thereof in which 0.05–1.0 g/m² of tin calculated from said iron-tin alloy is present on said steel sheet

which comprises electro-tinplating a steel sheet with an aqueous electrolyte consisting essentially of 5–150 g/l of at least one sulfate selected from the group of sulfates of alkaline metals, ammonium, aluminum, manganese and chromium in a stannous sulfate electrolyte or stannous phenolsulfonate electrolyte consisting of 1.5–50 g/l of stannous ions, 1.0–30 g/l of sulfuric acid or 3.6–106.5 g/l of phenolsulfonic acid, and 1–3 g/l of ethoxylated α-naphthol sulfonic acid and wherein the ratio of said stannous ions to said sulfuric acid or said phenolsulfonic acid is 1–3:1 or 1–3:3.6, respectively, and

heating said tin-plated steel sheet at a temperature of 232°–400° C. for 0.5–10 seconds.

3. In a process for producing an electrotinplate in which excellent corrosion resistance is required which comprises preplating a steel sheet with tin followed by a conventional tinplating step,

the improvement which comprises preplating a steel sheet by using an aqueous electrolyte containing 5–150 g/l of at least one sulfate selected from the group of sulfates of alkaline metals, ammonium, aluminum, manganese or chromium in a stannous sulfate electrolyte or stannous phenolsulfonate electrolyte consisting essentially of 1.5–50 g/l of stannous ions, 1.0–30 g/l of sulfuric acid or 3.6–106.5 g/l of phenolsulfonic acid, and 1–3 g/l of ethoxylated α-naphthol sulfonic acid and wherein the weight ratio of said stannous ions to said sulfuric acid or said phenolsulfonic acid is 1–3:1 or 1–3:3.6 at a temperature of 25° to 60° C. and under a cathodic current density of 5–50 A/dm² followed by tinplating the preplated steel sheet in a conventional tinplating step which is performed in an aqueous electrolyte consisting of 15–50 g/l of stannous ions, 10–30 g/l of sulfuric acid or 36–106.5 g/l of phenolsulfonic acid and 3–10 g/l of ethoxylated α-naphthol sulfonic acid at a temperature of 25° to 60° C. and under a cathodic current density of 5–50 A/dm².

4,388,159

SURFACE PREPARATION OF ALUMINUM ARTICLES

Kostas F. Dockus, Cicero, and William D. Sproul, Palatine, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 18, 1981, Ser. No. 264,311
Int. Cl.[3] C25D 5/44; B05D 3/12
U.S. Cl. 204—33 2 Claims

1. A process for providing the surface of an aluminum-silicon brazing alloy sheet with a bond-promoting metallic plating comprising the steps of abrading said surface with a low-density abrasive product comprising a plurality of flexible, tough fiberous members intertwined and bonded together and having abrasive granules randomly distributed throughout and bonded thereto, in the presence of a solvent selected from the group consisting of C_1–C_4 alcohols, then depositing on said surface said metallic plating selected from the group consisting of nickel, nickel-lead alloy, cobalt, cobalt-lead alloy and a combination thereof.

4,388,160

ZINC-NICKEL ALLOY ELECTROPLATING PROCESS

George B. Rynne, Rt. 1, Box 150D, Chatsworth Hwy., Ellijay, Ga. 30540

Continuation-in-part of Ser. No. 123,109, Feb. 20, 1980, Pat. No. 4,285,802. This application Aug. 24, 1981, Ser. No. 295,758
The portion of the term of this patent subsequent to Aug. 25, 1998, has been disclaimed.
Int. Cl.[3] C25D 3/56, 5/48
U.S. Cl. 204—38 R 18 Claims

3. A process for applying to a workpiece a bright zinc-nickel alloy electroplated deposit having superior corrosion resistance, said process comprising:

(1) preparing an aqueous bath comprising, on a per liter basis:

(a) a soluble zinc compound providing 30 to 100 grams of zinc as metal and selected from the group consisting of zinc chloride and zinc oxide;

(b) a soluble nickel salt providing up to 10 grams of nickel as a metal, said soluble nickel salt being nickel chloride;

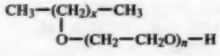
(c) an ammoniated electrolyte providing 1–10 grams of ammonium ions, said ammoniated electrolyte being ammonium chloride;

(d) a buffer;

(e) a non-ammoniated electrolyte selected from the group consisting of potassium chloride and sodium chloride, said non-ammoniated electrolytes providing 25 to 300 grams of chloride ions;

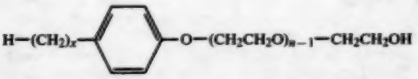
(f) 5-50 grams of a polyoxyalkylated surfactant selected from the group consisting of:

block copolymers of ethylene oxide and linear alcohols having the following structural formula;



wherein x is an integer from 9 to 15 and n is an integer from 10 to 50;

block copolymers of ethylene oxide and phenol alcohols having the following structural formula;



wherein x is an integer from 6 to 15 and n is an integer from 10 to 50;

block copolymers of ethylene oxide and monoethanol amine coconut fatty acid condensate;

alkoxylated alkyl phenols, alkoxylated alkyl naphthols, alkoxylated aliphatic monohydric alcohols, alkoxylated polyoxproypylene glycols, alkoxylated 2,4,7,9-tetramethyl-5-decyne-4,7-diol, alkoxylated ethylene diamine, alkoxylated fatty acids, alkoxylated amides, alkoxylated esters; and

(g) 0.05–4 grams of an aromatic carbonyl compound;

(2) maintaining acid conditions in the bath with a pH of at least about 4;

(3) maintaining said bath at a temperature of at least 10° C.;

(4) causing codeposition of the nickel and zinc to form a zinc-nickel alloy electroplated deposit on the workpiece; and

(5) controlling the amount of nickel ions and ammonium ions in the bath to limit the deposition of nickel and to cause deposition of a zinc-nickel alloy electroplate containing at least 96 percent by weight of zinc and an amount of nickel effective to provide superior corrosion resistance.

7. A process according to claim 3 or claim 5, wherein the amount of said nickel salt is from 1 to 10 grams.

13. A process according to claim 7 wherein the bright zinc-nickel alloy electrodeposit on the workpiece has an alloy nickel content of at least about 1 percent by weight and is provided with a subsequent chromate conversion coating.

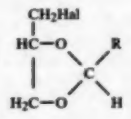
4,388,161

ACID TIN BATH AND TIN/LEAD BATH RESPECTIVELY FOR THE ELECTRODE-POSITION OF LUSTROUS COATINGS OF TIN AND TIN/LEAD RESPECTIVELY

Simeon Acimovic; Karl-Heinz Lindemann, and Volker G. Kunz, all of Trebur, Fed. Rep. of Germany, assignors to Elektro-Brite GmbH & Co. KG, Trebur, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 233,171, Feb. 10, 1981, abandoned. This application Jun. 24, 1982, Ser. No. 392,451
Int. Cl.[3] C25D 3/32, 3/60
U.S. Cl. 204—43 S 4 Claims

1. Acid tin bath and tin/lead bath respectively for the electrodeposition of lustrous tin coatings and tin/lead coatings respectively containing tin salts and optionally lead salts, aldehydes and/or ketones as brighteners as well as surfactants besides sulfuric acid and/or borofluohydric acid characterized in that it contains in place of part or all of the aldehydes and/or ketones a cyclic reaction product of one or more aromatic aldehydes and epihalohydrin of the general formula



(Hal=chlorine or bromine, R=a phenyl, naphthyl or pyridyl radical optionally substituted by one to three members of the group consisting of chlorine, bromine and fluorine atoms, alkyl and alkoxy groups having 1 to 3 carbon atoms, carboxy and hydroxy groups).

4,388,162

CONTINUOUS FLOW ELECTROCHEMICAL CELL AND PROCESS

Anthony F. Sammells, Naperville, and Michael R. St. John, Chicago, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

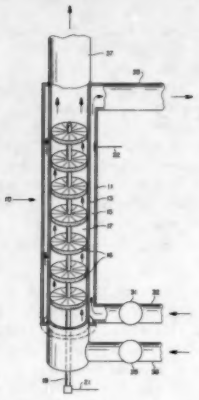
Filed Feb. 8, 1982, Ser. No. 346,748
Int. Cl.[3] C25B 1/10, 3/02, 9/04
U.S. Cl. 204—78 17 Claims

1. A process for hydrogen production by water electrolysis comprising:

continuously passing an anolyte comprising acidic aqueous slurry of solid organic carbonaceous particles through a central elongated anolyte chamber of a tubular electrochemical cell formed by an elongated tubular hydrogen ion permeable separator contacting an anode comprising a

plurality of brush-type electron conducting extensions attached in electrical communication to a coaxial central electron conducting current collector shaft and projecting radially therefrom a distance substantially to said separator oxidizing the carbonaceous component of said solid organic carbonaceous particles forming hydrogen ions and oxidized carbonaceous material;

continuously passing a catholyte comprising an aqueous acidic solution through an annular catholyte chamber



surrounding said anolyte chamber and defined by said hydrogen ion passing separator and a coaxial outer elongated electrolyte retaining tubular cathode;

passing said hydrogen ions through said anolyte, separator, and catholyte to said tubular cathode where molecular hydrogen is formed; and

continuously withdrawing said oxidized carbonaceous material from said anolyte chamber and said hydrogen from said catholyte chamber.

4,388,163

METHOD FOR THE INDIRECT OXIDATION OF UREA

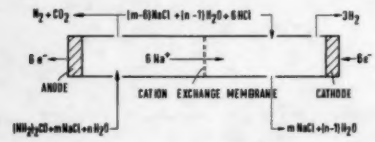
Gerhard Richter; Erhard Weidlich, both of Erlangen, and Konrad Mund, Uttenreuth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 13, 1981, Ser. No. 310,984

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1980, 3040470

Int. Cl.³ C25B *1/24*

U.S. Cl. 204—101 **14 Claims**



1. A method for the indirect oxidation of urea in an aqueous chloride-containing urea solution through electrochemical means, comprising:

providing an electrochemical cell containing distinct anode and cathode compartments separated from each other by an ion-conducting membrane, said anode compartment containing the anode of said cell and said cathode compartment containing the cathode of said cell;

supplying said aqueous chloride-containing urea solution to the anode compartment of said electrochemical cell wherein, by means of electrochemical oxidation, chloride is converted to chlorine and urea is then oxidized by said chlorine;

passing said solution to the cathode compartment of said electrochemical cell wherein, by means of electrochemical reaction, hydrogen is formed and evolved; and thereafter removing said solution from the cathode compartment.

4,388,164

METHOD OF COATING THE SURFACE OF AN ELASTIC BODY WITH A CONTINUOUS LAYER

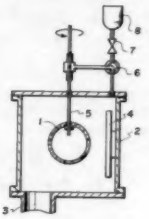
Eberhard Moll, Triesen, Liechtenstein, and Marcel Lardon, Maienfeld, Switzerland, assignors to Balzers Aktiengesellschaft, Liechtenstein

Filed Dec. 3, 1980, Ser. No. 212,560

Claims priority, application Switzerland, Dec. 6, 1979, 10820/79

Int. Cl.³ C23C *15/00*; B05D *3/12*; A61F *1/00*

U.S. Cl. 204—192 SP **7 Claims**



1. A method of coating the surface of an elastic implant which surface is deformable in use by a particular maximum amount, the coating being sufficiently ductile to deform with the surface without cracking, and the coating being a continuous layer of metal on the surface, which metal is not otherwise sufficiently ductile to deform with deformation of the implant surface in use without cracking, comprising:

temporarily expanding the implant in at least one dimension to temporarily enlarge said surface to be coated by at least an amount equal to said maximum amount of deformation in use;

then depositing said layer of metal on the surface which is enlarged by sputtering in a vacuum; and

returning the implant to its non-expanded state; whereby the layer of metal on the surface will accept deformation of the implant in use, without cracking.

4,388,165

SELECTIVE ION SENSITIVE ELECTRODE AND METHOD OF MAKING IT

Kiyozo Koshiishi, Sagamihara; Noriaki Ono, Hachiojo; Takashi Kamiyama, Tokyo, and Yoshimi Kato, Hachiojo, all of Japan, assignors to Olympus Optical Company Ltd., Japan

Filed Aug. 31, 1981, Ser. No. 298,343

Claims priority, application Japan, Feb. 28, 1981, 56-26730[U]

Int. Cl.³ G01N *27/30*

U.S. Cl. 204—418 **26 Claims**

1. A selective ion sensitive electrode including an ion exchanger selectively sensitive to a specific ion, comprising:

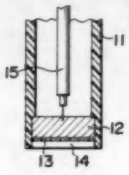
an electrode member to which a signal wire is connected on one side thereof, said member comprised of one of a metal, an electrically conductive resin and a chlorinated metal;

a corrosion resistant conductive thin film formed on the opposite side of said electrode member from said signal wire;

a layer of a silane coupling agent on said corrosion resistant conductive thin film; and

an ion exchanger formed on the surface of said layer of a silane coupling agent.

23. A process of forming a selective ion sensitive electrode comprising the steps of providing an electrode member to which a single wire is connected on one side thereof, said member comprised of one of a metal, an electrically conductive resin and a chlorinated metal, a corrosion resistant conductive thin film formed on the opposite side of said member from



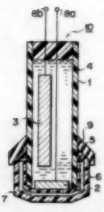
said signal wire and a layer of a silane coupling agent on the surface of said corrosion resistant conductive thin film; applying a solution having an ion exchange substance dissolved in a volatile solvent to the surface of said layer of silane coupling agent; and allowing the solvent to evaporate to form an ion exchanger on said layer of silane coupling agent.

4,388,166

ELECTROCHEMICAL MEASURING APPARATUS PROVIDED WITH AN ENZYME ELECTRODE

Shuichi Suzuki; Masuo Aizawa, both of Tokyo; Masao Koyama, Yokohama; Yuichi Sato, Atsugi, and Junji Koezuka, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 175,038, Aug. 4, 1980, abandoned. This application May 15, 1982, Ser. No. 357,811
Claims priority, application Japan, Aug. 14, 1979, 54-102761
Int. Cl.³ C12Q *1/26*
U.S. Cl. 204—403 **7 Claims**



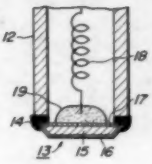
1. An electrochemical measuring apparatus provided with an enzyme electrode which comprises an electrode having adjacent thereto a filter membrane which is permeable to a material to be detected but impervious to a material of larger particle size than the material to be detected, a separate immobilized enzyme membrane deposited on said filter membrane, and an asymmetric semipermeable membrane mounted on the immobilized enzyme membrane, said asymmetric semipermeable membrane being essentially formed of an outer thin semipermeable layer of a thickness less than 1 micron exposed to contact with a liquid to be measured and an inner thick porous layer within said thin semipermeable layer, whereby the concentration of an organic ingredient contained in said liquid to be measured is determined by utilizing the reaction of the enzyme set in said immobilized enzyme membrane.

4,388,167

ION SELECTIVE ELECTRODE

Noriaki Ono, Akishima, and Takashi Kamiyama, Tokyo, both of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Aug. 30, 1982, Ser. No. 413,133
Claims priority, application Japan, Sep. 7, 1981, 56-131899[U]
Int. Cl.³ G01N *27/26, 27/30*
U.S. Cl. 204—420 **15 Claims**



1. An ion selective electrode for measuring an ion concentration of particular ion contained in a sample liquid comprising

a tubular member made of electrically insulating material;

a silicon wafer substrate applied onto one end of the tubular member by means of an adhesive layer and having inner and outer surfaces and a side edge, at least a part of which side edge is tapered inwardly viewed in a direction from the inner surface to the outer surface;

an ion sensitive film applied on both the outer surface and the tapered portion of side edge of silicon wafer substrate; and

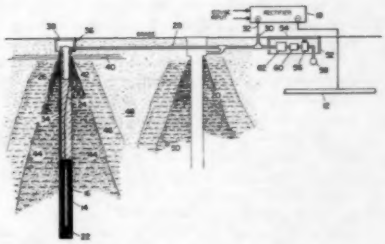
a signal wire having a core conductor connected to the inner surface of silicon wafer substrate and extending outwardly from the other end of tubular member.

4,388,168

LOW RESISTANCE ELECTRODE SYSTEM

William H. Burkhart, Los Altos, Calif., assignor to Smith & Denison, Hayward, Calif.

Filed May 27, 1980, Ser. No. 153,618
Int. Cl.³ C23F *13/00*
U.S. Cl. 204—196 **10 Claims**



1. A system for maintaining a substantially constant low resistance between a buried electrode and the earth comprising:

at least one electrode;

means for storing a several month's supply of salt;

means for dissolving said salt to produce a saturated solution;

means for mixing fresh water with said saturated solution so as to form a dilute salt solution;

said mixing means including long capillary tube means for controlling the flow of said saturated salt solution, and short capillary tube means for controlling the more rapid flow of fresh water to be mixed with said saturated salt solution;

means for controlling both the rate of flow of the dilute solution and its salt content so as to produce a salt solution having substantially constant resistivity in the range from 50 to 2,000 ohm-centimeters; and

means for distributing said salt solution to the earth surrounding said electrode to thereby substantially reduce the resistance between said electrode and the earth.

4,388,169

APPARATUS FOR SURFACE TREATMENT OF A STEEL STRIP

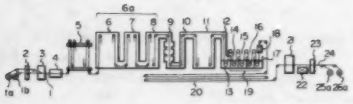
Norichika Nagira; Hiroshi Ikegami; Hiroji Baba, all of Kitakyushu, and Kanji Yahano, Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 5, 1981, Ser. No. 260,725

Claims priority, application Japan, Oct. 9, 1980, 55-141307

Int. Cl.³ C25D *17/00*

U.S. Cl. 204—207 **4 Claims**



1. An apparatus for the surface treatment of a steel strip, particularly a strip from a continuous annealing apparatus, which strip is adversely affected if allowed to become dry prior to the time it leaves the surface treatment apparatus, said surface treatment apparatus comprising:

(1) a plurality of guide rolls for moving the steel strip along a predetermined path;

(2) a pickling vessel through which a portion of said steel strip path extends, and a first pickling liquid spray means in said pickling vessel for spraying a pickling liquid toward at least one surface of said steel strip as it passes through the pickling vessel, said path extending upwardly out of said pickling vessel and around one of said guide rolls; a further pickling liquid spray means positioned adjacent the top of the path from said pickling vessel at the point where the strip passes around said one of said guide rolls for spraying pickling liquid onto said one surface for keeping the surface wet with pickling liquid;

(3) a first rinsing vessel through which a portion of said steel strip path extends and which is located downstream with respect to the movement of the strip along said path of said pickling vessel, first rinsing water spray means in said first rinsing vessel for spraying rinsing water toward said at least one surface of the steel strip as it passes through said first rinsing vessel, said path extending upwardly out of said first rinsing vessel and around one of said guide rolls; a further rinsing water spray means positioned adjacent the top of the path from said first rinsing vessel at the point where the strip passes around said guide roll for spraying rinsing water onto said one surface of the steel strip for keeping the surface wet with rinsing water;

(4) an electrolytic treating vessel for containing an electrolytic treating liquid and through which a portion of said steel strip path extends and which is located downstream of said first rinsing vessel, and at least one anode positioned in said electrolytic treating vessel at a position below the level of the electrolytic treating liquid therein and facing the said one surface of the steel strip, and means operatively associated with said electrolytic treating vessel for controlling the temperature of the electrolytic treating liquid; said path extending upwardly out of said electrolytic treating vessel and around one of said guide rolls; an electrolytic treating liquid spray means positioned adjacent the top of said path from said electrolytic treating vessel at the point where the strip passes around said guide roll for spraying electrolytic treating liquid on said one surface of said strip for keeping said surface wet with electrolytic treating liquid;

(5) a second rinsing vessel through which a portion of said steel strip path extends and which is located downstream of said electrolytic treating vessel, second rinsing water spray means in said second rinsing vessel for spraying rinsing water toward said at least one surface of the steel strip as it passes through said second rinsing vessel, said path extending upwardly out of said second rinsing vessel; and

(6) said guide roll at the top of the path from said electrolytic treating vessel being of a conductive material, and voltage applying means for applying an electrolyzing voltage between said anode and said conductive material guide roll.

4,388,170

PROCESS FOR PRODUCING LOWER-MOLECULAR-WEIGHT HYDROCARBONS FROM HIGHER MOLECULAR-WEIGHT HYDROCARBONS AND AUXILIARY AGENT THEREFOR

Klaus Schmid, Libauerstr. 27, 89000 Munich 81, and Hannes Kneissl, Kurstr. 18, 8184 Gmund am Tegernsee, both of Fed. Rep. of Germany

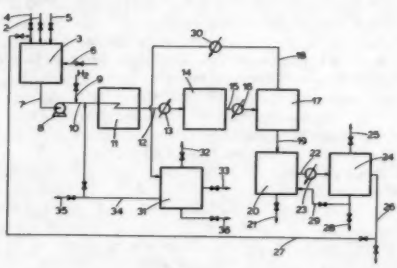
PCT No. PCT/EP80/00140, § 371 Date Aug. 3, 1981, § 102(e) Date Aug. 3, 1981, PCT Pub. No. WO81/01576, PCT Pub. Date Jun. 11, 1981

PCT Filed Nov. 27, 1980, Ser. No. 290,812

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948789; May 5, 1980, 3017170

Int. Cl.³ C10G *1/04, 1/06*

U.S. Cl. 208—8 LE **17 Claims**



1. A process for producing liquid or gaseous lower-molecular-weight hydrocarbons from hydrocarbonanceous solid or liquid fossil-fuel raw materials having a higher molecular weight, which process comprises heating said hydrocarbonaceous materials together with hydrogen and a minor amount, up to 10 weight per cent based on the weight of said hydrocarbonaceous materials, of at least one guanidinium compound, at a temperature in the range 250° to 500° C., a pressure in the range 10 to 300 bar and a time in the range 0.1 to 60 minutes.

4,388,171

SUPERCRITICAL MULTICOMPONENT SOLVENT COAL EXTRACTION

James M. Beggs, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; William H. Corcoran, San Gabriel, Calif.; William S. Fong, Cambridge, Mass.; Puvin Pichaichanarong; Paul C. F. Chan, both of Pasadena, Calif., and Daniel D. Lawson, Arcadia, Calif.

Filed Oct. 30, 1981, Ser. No. 315,584

Int. Cl.³ C10G *1/00, 1/06*

U.S. Cl. 208—8 LE **14 Claims**

1. A method of separating an organic extract from coal comprising the steps of:

adding particulate coal and a mixture consisting essentially of a first solvent and a second solvent; said first solvent being present in the solvent mixture in an amount from 0.1 to 20% by weight and having a molecular diameter at least 50% smaller than the average pore diameter of the coal and said second solvent having a larger molecular diameter than the first solvent and being an efficient coal-extracting solvent;

heating the reactor to a temperature above the critical temperature for the solvent mixture but below 450° C. at a pressure of 500 to 10,000 psig to supercritical fluid form;

extracting organic coal components into the supercritical fluid phase; and

removing said phase from the reactor.

4,388,172
LIQUEFACTION OF COAL

Bernhard Rodewald, Mannheim; Kurt Tippmer, and Hans F. Tamm, both of Recklinghausen, all of Fed. Rep. of Germany, assignors to Ruhrkohle Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 306,687

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038309

Int. Cl.³ C10G *1/06*

U.S. Cl. 208—10 **8 Claims**

1. In a method for the liquefaction of coal having chlorine-containing compounds comprising hydrogenation of said coal in the presence of a catalyst, the improvement which comprises neutralizing said compounds with alkali metal hydrogen sulfide whereby H_2S is produced.

4,388,173
METHOD AND APPARATUS FOR DISTILLATION OF OIL SHALE

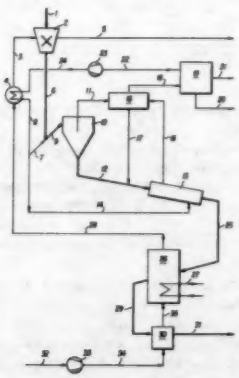
Gerd Eacher, Gelsenkirchen-Buer; Heinz Frohnert, Bottrop, and Hans-Peter Wenning, Dorsten-Rhade, all of Fed. Rep. of Germany, assignors to Veba Oel Ag, Gelsenkirchen-Buer, Fed. Rep. of Germany

Filed Jun. 24, 1981, Ser. No. 277,001

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023670

Int. Cl.³ C10B *53/06*

U.S. Cl. 208—11 R **16 Claims**



1. A method for the distillation of oil shale in a distillation cyclone reaction using a hot gas to heat said oil shale comprising:

utilizing distillation gas as said hot gas after separation of the condensable portion of said distillation gas;

removing a portion of said hot gas corresponding to the increase in the amount of gas generated by distillation, tangentially introducing said stream of oil shale and hot gas, in combination, into said distillation cyclone reactor; and

re-heating the residual portion of said hot gas without adding solid material.

4,388,174
PROCESS OF RECOVERING OIL FROM OIL-CONTAINING MINERALS

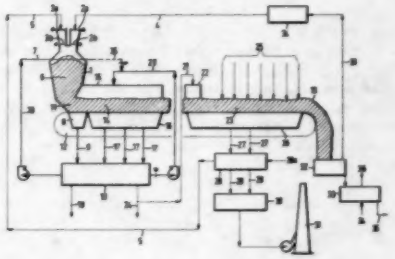
Norbert Magedanz, Hasselroth; Horst Seidel, and Hans J. Weiss, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 10, 1982, Ser. No. 387,072

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124019

Int. Cl.³ C10G *1/00*; C10B *49/18, 51/00, 53/06*

U.S. Cl. 208—11 R **9 Claims**



1. In a process of recovering oil from an oil-containing mineral by retorting said oil containing material and separating of oil in a separating stage from the retort gases obtained therefrom which contain the retorting products, and solid carbon contained in the retorted material after the retorting is burnt by a supply of oxygen-containing gases, part of the resultant burnt hot mineral in admixture with the oil-containing mineral is charged into a retorting shaft reactor whereby the oil-containing mineral is heated and retorted, the improvement wherein at least a portion of the retorting is effected in a retorting shaft reactor, the mineral from the retorting reactor is charged onto a traveling grate, a subsequent retorting is effected in an after-retorting zone, in which inert or reducing gases are passed through the material, the gases from the retorting reactor and from the after-retorting zone are supplied to the said separating stage and oil is removed from said gases in said separating stage, the retorted bed of material is moved on the traveling grate to a combustion zone, said solid carbon contained in said mineral in the surface of said bed is ignited at the beginning of the combustion zone, oxygen-containing gases are then sucked through the bed to cause the burning zone to move through the bed, the resultant burnt mineral is discharged from the traveling grate and part of the fired mineral is recycled to the retorting reactor.

4,388,175
HYDROCARBON CONVERSION PROCESS

Thomas A. Lionetti, Houston, and Charles H. Schrader, Groves, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,625

Int. Cl.³ C10G *11/05, 55/08*

U.S. Cl. 208—74 **5 Claims**

1. In a fluid catalytic cracking process wherein a hydrocarbon stock containing sulfur is subjected to catalytic cracking in a fluid catalytic cracking zone, and hydrocarbon products effluent from said cracking zone are separated into fractions including a heavy cycle gas oil fraction having a boiling range

above about 340° C., the method of producing an aromatic feedstock for the production of needle coke by delayed coking which comprises:

(a) subjecting said heavy cycle gas oil to hydrotreating in a hydrotreating zone,

(b) passing a fraction of effluent from said hydrotreating zone boiling above 340° C. to catalytic cracking in a second fluid catalytic cracking reaction zone effecting conversion of said hydrotreated heavy cycle gas oil to light olefins and normally liquid aromatic hydrocarbons,

(c) separating a light olefins fraction from the effluent from said second fluid catalytic cracking reaction zone,

(d) recovering normally liquid aromatic hydrocarbons boiling below about 340° C. from the effluent from said second catalytic cracking zone,

(e) and recovering an aromatic heavy gas oil fraction boiling above about 340° C. from the effluent of said second fluid catalytic cracking zone suitable as feedstock for the production of needle coke by delayed coking.

4,388,176

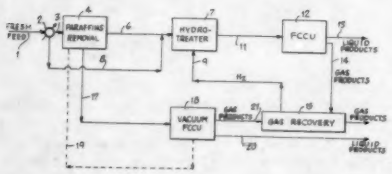
HYDROCARBON CONVERSION PROCESS

Roy E. Pratt, Port Neches; Scott M. Sayles, Nederland, both of Tex.; Kerry W. Bowers, Birmingham, Ala., and Richard P. Scott, deceased, late of Groves, Tex. (by Candice C. Scott, executrix), assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 19, 1981, Ser. No. 323,097

Int. Cl.³ C10G *11/05, 25/03, 51/06, 55/08*

U.S. Cl. 208—80 **14 Claims**



1. In a process for conversion of heavy paraffinic vacuum gas oil fractions into desirable products by a fluid catalytic cracking process, the improvement which comprises separating paraffins from the vacuum gas oil thereby producing a deparaffined oil, hydrotreating said deparaffined oil, subjecting hydrotreated deparaffined oil to catalytic cracking in a first fluid catalytic cracking zone at a temperature in the range of 520° to 540° C., separately subjecting said paraffins removed from the vacuum gas oil to catalytic cracking in a second fluidized catalytic cracking zone at a temperature in the range of 650° to 700° C., and recovering light olefins and normally liquid motor fuel blending components from the products of said fluid catalytic cracking operations.

4,388,177

PREPARATION OF NATURAL FERRIERITE HYDROCRACKING CATALYST AND HYDROCARBON CONVERSION WITH CATALYST

Emmerson Bowes, Woodstown, and Bruce P. Pelrine, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 225,079, Jan. 13, 1981, Pat. No. 4,335,019. This application Mar. 8, 1982, Ser. No. 355,439

Int. Cl.³ C10G *47/18*

U.S. Cl. 208—111 **14 Claims**

1. A process for selectively hydrocracking straight chain and single methyl-branched hydrocarbons from a feed selected from the group consisting of reformate and waxy hydrocarbon oil comprising contacting said feed and hydrogen under conversion conditions with a catalyst composition comprised of natural ferrierite treated by contacting it with an oxalate ion under conditions effective to impart to the ferrierite a Constraint Index from about 1 to 12, the ferrierite further comprising at least one hydrogenation component selected from the metals of Group VIA and Group VIII of the Periodic Table.

4,388,178

CATALYTIC CRACKING PROCESS

Paul H. Lewis; Joseph A. Durkin, both of Groves, and Joseph A. Froelich, Nederland, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 198,859, Oct. 20, 1980, Pat. No. 4,324,698. This application Dec. 24, 1981, Ser. No. 334,413

Int. Cl.³ C10G *11/05, 11/08, 11/18;* **B01J** *29/12*

U.S. Cl. 208—115 **3 Claims**

1. In a process wherein a petroleum hydrocarbon feedstock is contacted with a zeolite cracking catalyst under hydrocarbon cracking conditions including a temperature in the range of 850° to 950° F., the improvement which comprises contacting said hydrocarbon with a catalyst consisting of at least 90 percent by weight of a composite of a Y-zeolite in a silica-alumina matrix, said composite containing from about 0.1 to about 5 percent by weight fluorine.

4,388,179

MAGNETIC SEPARATION OF MINERAL PARTICLES FROM SHALE OIL

Robert T. Lewis, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 24, 1980, Ser. No. 210,110

Int. Cl.³ C10G *1/00;* **B03B** *1/02;* **B03C** *1/00;* **B07B** *1/00*

U.S. Cl. 208—177 **11 Claims**

1. A process for separating oil shale mineral solids from a fluid feed comprising retorted shale oil in the liquid or gaseous state, comprising the steps of:

(a) heating said mineral solids to at least the magnetic transformation temperature of at least a portion of said mineral solids; and

(b) thereafter exposing said feed to a magnetic field to cause the migration of said mineral solids under the influence of said magnetic field to concentrate the solids and provide a fluid product having a reduced solids concentration.

4,388,180

METHOD FOR BENEFICIATION OF PHOSPHATE ROCK

Andrew Rainis, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 14, 1981, Ser. No. 330,300

Int. Cl.³ B03D *3/06*

U.S. Cl. 209—5 **4 Claims**

1. A method of removing gangue minerals from phosphate rock comprising:

(a) forming an aqueous slurry of gangue mineral containing phosphate rock;

(b) adjusting the pH of the slurry to between 10 and 11;

(c) adding to said slurry a surface conditioner selected from the group consisting of oleic acid, fatty acids, and high molecular weight organic acids;

(d) using a nonpolar, water insoluble, bridging hydrocarbon having a boiling point of less than 70° C. to selectively form agglomerates of phosphates;

(e) separating the agglomerates of phosphates from the slurry containing the gangue minerals;

(f) recovering the bridging hydrocarbon; and

(g) recycling the bridging hydrocarbon to step (d).

4,388,181

METHOD FOR THE PRODUCTION OF METALLURGICAL GRADE COAL AND LOW ASH COAL

Andrew Rainis, Walnut Creek, and Clifford M. Detz, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 14, 1981, Ser. No. 330,303
Int. Cl.³ B03D 1/08, 3/06
U.S. Cl. 209—12 5 Claims

1. A method of producing a metallurgical grade coal and a low ash coal comprising:

(a) forming an aqueous slurry of coal containing vitrinite, ash and pyritic sulfur;

(b) adding to said slurry a froth flotation reagent;

(c) subjecting said slurry to froth flotation to produce an overflow and an underflow, wherein said overflow is rich in vitrinite and has a low content of ash and pyritic sulfur; and wherein said underflow has a low content of vitrinite and is rich in ash and pyritic sulfur;

(d) filtering and drying the froth flotation overflow to produce a metallurgical grade coal;

(e) using a nonpolar, water insoluble, bridging hydrocarbon having a boiling point of less than 70° C. to selectively form agglomerates of coal from said underflow;

(f) separating the agglomerates of coal from the underflow containing the ash and pyritic sulfur;

(g) recovering the bridging hydrocarbon; and

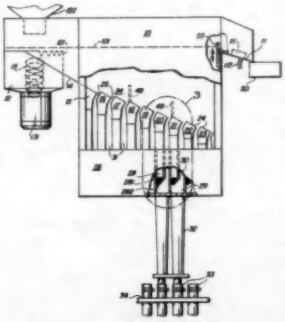
(h) recycling the bridging hydrocarbon to step (e).

4,388,182

MINERAL SEPARATION BY PARTICLE SETTLING CHARACTERISTICS

H. Gene Hudson, 10625 N. 37th Way, Phoenix, Ariz. 85028

Filed Aug. 21, 1981, Ser. No. 295,150
Int. Cl.³ B03B 5/66
U.S. Cl. 209—17 47 Claims



1. In mineral separation apparatus having means for passing materials bearing minerals and similar substances past an upwelling flow of fluid wherein desired materials move counter to said upwelling flow to first collection means and undesired materials move along said upwelling fluid flow to second collection means, the improvement comprising:

retardation means for retarding the counter movement of such materials as they enter within said upwelling fluid flow to increase the effective interaction time of said fluid flow on such materials as may enter said fluid flow and attempt to move counter thereto; and

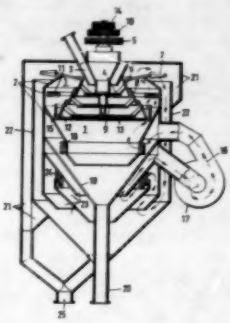
means for inhibiting the interaction of all said materials with other than an upwelling flow of fluid.

4,388,183

SWIRLING AIR CENTRIFUGAL SCATTER CLASSIFIER

Franz Thomas, Beckum, Fed. Rep. of Germany, assignor to Christian Pfeiffer, Beckum, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 304,334
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1980, 3038625
Int. Cl.³ B07B 7/083
U.S. Cl. 209—139 A 14 Claims



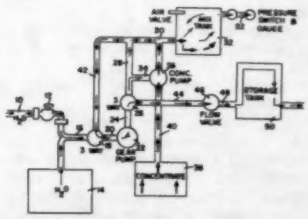
1. In a scatter classifier having a housing, a system for producing a swirling gas current in said housing, an upper first scatter plate, a lower second scatter plate under said upper plate, a system for turning said plates about a common upright axis at different speeds, said lower second plate having a greater diameter than said upper first plate, a middle feed inlet duct over said upper first plate, a system without said housing for producing a classifying gas current within said housing, said upper first plate having a first baffle ring thereon and designed to be turned therewith for guiding said feed, as moved by said plate, with a baffle function, the improvement residing in that said lower second plate has a second baffle ring thereon designed to be turned therewith.

4,388,184

PRESSURE AND FLUID FLOW ACTIVATED, SIMPLIFIED PROPORTIONING SYSTEM

Donald Brous, 110 Hunt Rd., Peterborough, N.H. 03458, and Robert H. Cox, 33 Ferncliff Rd., Scarsdale, N.Y. 10583

Continuation-in-part of Ser. No. 161,065, Jun. 19, 1980, abandoned. This application Sep. 14, 1982, Ser. No. 418,046
Int. Cl.³ B01D 31/00
U.S. Cl. 210—96.2 11 Claims



1. A proportioning system comprising a proportioning mixing tank, a storage tank, a source of concentrate, a source of diluent, a constantly acting pump means, and lines for directing the diluent from said source of diluent to the proportioning tank and from the proportioning tank to the storage tank, the pump means pumping concentrate through a conduit from said source of concentrate into the proportioning tank in a prearranged proportion of the concentrate and the diluent,

a first sensor operated pressure actuated switch means associated with the proportioning tank for actuation at a certain predetermined pressure in the proportioning tank as said proportioning tank fills, and a second sensor operated fluid flow switch means located in the line just prior to the storage tank for actuation at a predetermined fluid flow,

directional valve means in the lines between said pump means, the proportioning tank and the storage tank, said valve means being actuated first by said first sensor operated pressure actuated switch means for directing the fluid from the proportioning tank to the storage tank while said pump means is still operating, while said valve means shut off the proportioning tank from the concentrate and diluent, the second sensor operated fluid flow switch means being actuated to hold said valve means in this position as long as the flow exists continuing this state of said directional valve means, and said second sensor operated fluid flow switch means operating to reverse the directional valves to their original state to once more direct the diluent and concentrate to the proportioning tank.

4,388,185

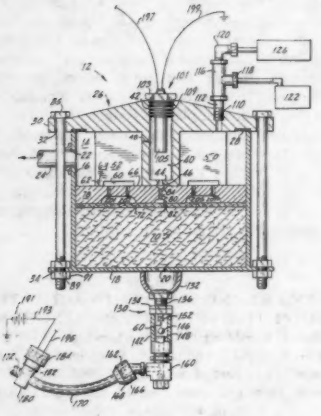
ELECTRIC OIL REFINER

Norman Ott, and Jeanette O. McKeachern, both of 6140 SW. 84th Ave., Miami, Fla. 33143

Filed Apr. 26, 1982, Ser. No. 371,616

Int. Cl.³ B01D *3/28, 27/08*

U.S. Cl. 210—136 **5 Claims**



1. For an engine to be operated under oil pressure, an oil refiner comprising,

an open top housing of a first predetermined diameter, said housing having generally tubular walls, a floor spanning the housing bottom, said housing having a side opening adjacent the open top and a central opening through said floor,

lid means sized to span the open end of the housing and means to secure the lid in closing relation of the housing,

said lid having (a) a depending central oil well defining structure of a predetermined height and (b) a plurality of depending radially extending fins extending from the oil well defining structure and each of the fins being of a common radial dimension less than that of said predetermined diameter and of a common predetermined vertical height equal to that of the height of the oil well defining structure, each fin having a lower end surface and radially facing surfaces, said radially facing surfaces being in spaced relation from said housing, said oil well defining structure having a floor with a central through orifice therethrough a radially facing opening adjacent, said lid in open communication with the interior of said housing, the lower end surface of said fins having a cutout therein providing a radially distally located foot on each fin and a portion adjacent to the oil well defining structure comprising a proximal foot on each fin,

a plate having a plurality of apertures therethrough and a central orifice in spanning relation of said housing and in abutting engagement with said fins and said oil well defining structure, and

a bed of waste material in the housing on the floor and beneath the plate,

a felt pad on the waste material and beneath the plate, said bed and said felt pad supporting said plate,

said bolts means to hold the lid in closing relation of the housing maintaining said fins and plate in abutting relation,

a heater means in said oil well defining structure and supported in spaced relation from said oil well defining structure and the bottom of said oil well defining structure, said heater means being adapted to be operatively connected to the electrical system of a vehicle upon which the oil refiner is installed,

a one-way check valve means in open communication with the opening in the floor of said valve and conduit means to interconnect the check valve means to the oil pump of the engine,

a normally open pressure operated switch in said conduit means responsive to pressure caused by an oil pump in the conduit to energize the heater means.

4,388,186

SLUDGE TREATING APPARATUS

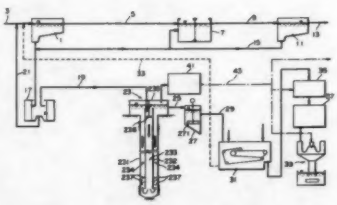
Tadao Fujimoto, Kobe, and Tadaaki Kawasugi, Nara, both of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Aug. 28, 1981, Ser. No. 297,257

Claims priority, application Japan, Mar. 7, 1980, 55-29599; Mar. 8, 1980, 55-29533; Jun. 13, 1980, 55-83151[U]; Jun. 13, 1980, 55-83160[U]

Int. Cl.³ C02F *11/04*

U.S. Cl. 210—170 **11 Claims**



1. An apparatus for treating a sludge produced by waste water treatment, comprising: mechanical condensing means (17) for forcedly condensing a produced raw sludge, an anaerobic digestion tank (23) of a deep well type buried to extend under the ground in the depth direction, fluid conduit means operatively connecting said digestion tank to said condensing means for receiving and anaerobically digesting the raw sludge condensed by said mechanical condensing means, said anaerobic digestion tank comprising a downward flow chamber extending in the depth direction for flowing a sludge being treated downwardly therethrough, an upward flow chamber disposed in association with said downward flow chamber and also extending in the depth direction, fluid communication means between said upward flow chamber and said downward flow chamber for flowing a sludge being treated therethrough in the upward direction, circulating means operatively connected to said downward flow chamber and said upward flow chamber for forcedly circulating the sludge being treated between said downward flow chamber and said upward flow chamber and for expediting the reaction in said anaerobic

digestion tank, and enclosure means for maintaining said digestion tank in an anaerobic condition, whereby conversion from fatty acid into methane gas and carbon dioxide takes place during the anaerobic digestion in said tank with simultaneous conversion from said carbon dioxide into methane gas as a result of the static pressure head afforded by the deep well location of said anaerobic digestion tank, said apparatus further comprising dewatering means operatively connected to said anaerobic digestion tank for receiving and dewatering the sludge digested by said anaerobic digestion tank, methane gas collecting means operatively connected to said anaerobic digestion tank for collecting methane gas produced in said anaerobic digestion tank, and post-treatment means operatively connected to said dewatering means for further treating the digested sludge after the sludge has been dewatered by said dewatering means, said post-treatment means comprising heat generating means, means operatively connected to said methane gas collecting means for supplying said methane gas collected by said methane gas collecting means to said post-treatment means as a source of energy for said heat generating means.

4,388,187

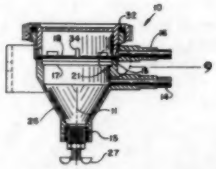
FUEL FILTER

Dustin D. Eaglestone, 2350 E. Iliff, #9, Denver, Colo. 80210

Continuation-in-part of Ser. No. 257,572, Apr. 27, 1981, abandoned, which is a continuation-in-part of Ser. No. 208,543, Jan. 5, 1981, abandoned. This application Mar. 18, 1982, Ser. No. 359,293

Int. Cl.³ B01D *21/00, 35/02*

U.S. Cl. 210—232 **4 Claims**



1. A fuel filter adapted for use in a fuel system comprising in combination:

a main body portion having a vertical axis passing therethrough and a relatively lower inlet connected to a fuel line in said fuel system and a relatively higher outlet connected in-line to said fuel line, said main body further including a reservoir therein having first separation means for draining said reservoir, said first separation means located at a bottommost location on said main body and in general alignment with said vertical axis,

second separation means including a baffle plate having a relatively small number of holes passing therethrough and a screen spaced a relatively small distance above said baffle plate, said baffle plate and screen mounted in said main body at a position intermediate said inlet and said outlet; and

a cap having an insert portion insertable within the main body and a skirt depending downwardly therefrom having connection means for connecting said cap to said main body, said insert portion of said cap adapted to seat against said screen and hold said screen into position within said main body and to further provide a flow passageway for fuel to pass from the interior of said cap and main body to said outlet.

4,388,188

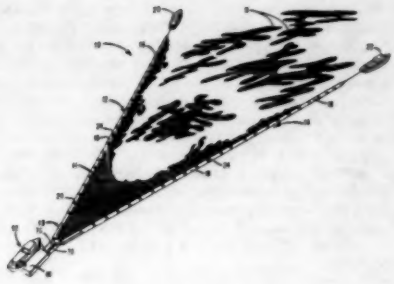
OIL SPILL RECOVERY MEANS

Robert D. Morris, 93 Kickimuit Ave., Bristol, R.I. 02809

Filed Apr. 13, 1981, Ser. No. 253,281

Int. Cl.³ B01D *21/00;* **E02B** *15/04*

U.S. Cl. 210—242.3 **13 Claims**



1. Apparatus for confining an oil slick and for skimming and funneling oil and water into a recovery means for the oil comprising:

(a) two elongated flotatable booms, each boom comprising a plurality of individual cylindrical-shaped flotatable sections interconnected together in series yet being capable of independent movement of one another;

(b) cylindrical-shaped compressible means of a diameter at least as large as the boom sections being located between each two next adjacent interconnected flotatable boom sections whereby to provide a flexible coupling of boom sections and a boom of relative unitary construction thereby permitting the boom sections each to move independently of one another with wave action and preventing the leaking of the oil/water slick between boom sections, the said compressible means being of sufficient thickness and having sufficient resistance to compression as to prevent the ends of adjacent boom sections from impacting one another;

(c) a flotatable catcher funnel connected to each of said flotatable booms at one end of each said boom which catcher funnel comprises a planar bottom of trapezoidal shape and pontoons attached to and flotatably supporting said bottom below the water's surface at a depth sufficient to recover any oil floating on the water's surface, said pontoons being located with respect to one another to provide a catcher funnel wider at its front end than at its rear end and confining the oil/water slick to an ever-narrowing inverted triangular-shaped area;

(d) flotatable recovery means detachably connected to the rear end of said flotatable catcher funnel for receipt of the oil/water discharged from the said funnel and for separating the oil from the water; and

(e) means connected to each said boom at its other end for maintaining the said booms forward of said catcher funnel in the desired pattern.

4,388,189

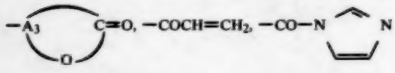
PROCESS FOR PREPARATION OF IMPROVED SEMIPERMEABLE COMPOSITE MEMBRANES

Takeyuki Kawaguchi, 1-28-5-207, Ozu-cho; Hiroyoshi Minematsu, 1-28-5-302, Ozu-cho, both of Iwakuni-shi, Yamaguchi-ken; Yuzuru Hayashi, 3-1-23, and Shigeyoshi Hara, 3-1-40, both of Yamate-machi, Iwakuni-shi, Yamaguchi-ken, all of Japan

Filed Dec. 24, 1980, Ser. No. 220,081
Claims priority, application Japan, Dec. 28, 1979, 54-170359
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—490 **32 Claims**

1. In a process for producing a semipermeable composite membrane which comprises forming on a microporous substrate a thin layer of polymeric material comprising a polyamino polymer containing at least 1 milliequivalent, per gram of the polymer in the dry state, of active amino groups selected from primary amino groups and secondary amino groups, and thereafter interfacially crosslinking a surface portion of said thin layer with a crosslinking agent comprising a cyclic compound having at least two functional groups (a) selected from the group consisting of carbonyl halide, sulfonyl halide, isocyanate and acid anhydride groups; the improvement wherein

(1) said polymeric material contains dispersed therein a polyfunctional aliphatic compound having at least two functional groups (b) which are selected from the group consisting of $-CH(OH)CH_2X_1$, $-COOA_1$, $-NHCOOA_2$,



and active halomethyl groups, in which X_1 and X_2 each represent a halogen atom, A_1 and A_2 each represent a hydrogen atom or an organic radical capable of being split off together with the oxygen atom to which it is bonded, and A_3 represents a trivalent or tetravalent saturated aliphatic groups having 2 to 5 carbon atoms, and are substantially incapable of reacting with the primary or secondary amino groups in said polymer at a temperature at which the interfacial crosslinking is carried out, but capable of reacting easily with either the primary or secondary amino groups or both in said polymer at a temperature at least 30° C. higher than said crosslinking temperature, and

(2) the interfacially crosslinked thin layer is heated to a temperature at which said polyfunctional compound reacts with the primary or secondary amino groups or both in said polymer.

31. A semipermeable composite membrane produced by any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29 or 30.

4,388,190

PLATE ASSEMBLY AND METHOD FOR INSTALLING SAME IN A SEPARATION DEVICE

Nicky M. Haddock, 11907 Mile Dr., Houston, Tex. 77065

Filed Mar. 28, 1979, Ser. No. 24,557
Int. Cl.³ B01D *21/00*
U.S. Cl. 210—522 **14 Claims**

1. A plate assembly for use in a cross flow separation device for separating components from a carrier liquid having components of a specific mass differing from that of the carrier liquid, comprising:

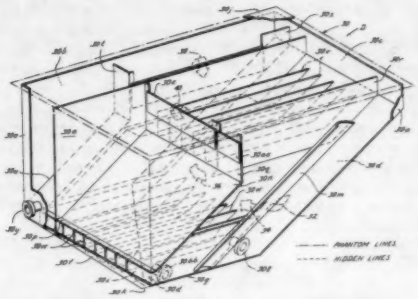
at least a first separating plate and a second separating plate adapted to be mounted within the separation device for enhancing separation of the components from the carrier liquid;

each of said separating plates having a top portion, an intake side portion, a bottom portion, a discharge side portion, a first plate surface, and a second plate surface;

each of said separating plates formed with said first plate surface being substantially parallel with said second plate surface;

said top portion, said intake side portion, said bottom portion, and said discharge side portion forming the perimeter of each of said separating plates;

said second plate surface of said first separating plate adapted to be disposed adjacent said first plate surface of said second separating plate within the separation device; and,



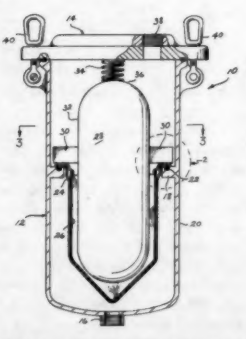
elongate spacer means mounted with said second separating plate at said top portion and said bottom portion and with the longitudinal axis of said spacer means extending along said second plate surface of said second separating plate between said top portion and said bottom portion for engaging and spacing said second plate surface of said second separating plate from said first plate surface of said first separating plate for enhanced coalescing and separation of the components from the carrier liquid within the separation device.

4,388,191

FLOAT BAG HOLD DOWN FOR A FILTER

Howard W. Morgan, 100 Anchor Rd., Michigan City, Ind. 46360

Filed Oct. 16, 1981, Ser. No. 311,961
Int. Cl.³ B01D *29/16*
U.S. Cl. 210—452 **2 Claims**



1. A filter for liquids comprising a housing including side and bottom walls with a top opening, said housing side wall carrying an annulus projecting into the interior of said housing, said annulus spaced from said housing top opening, a removable cap spanning said housing top opening, a bag-shaped removable reticulated filter element carried within said housing and having a circumferential outward flange supported upon said annulus, a liquid inlet in flow communication with the interior of said filter element and a liquid outlet in flow communication with the exterior of the filter element, a removable closed float means for decreasing the volumetric interior size of said hous-

ing, said float means having top and bottom end walls and side walls, said float means side walls having spaced arm parts extending radially therefrom, said float means inserted into said housing with said bottom end wall thereof extending into said filter element interior and arm parts overlying said filter element flange, a spring compressed between said cap and said float means top end wall urging said filter element flange by said float means arm parts against said housing side wall annulus, at least a portion of said float means side wall being spaced from said filter element whereby liquid entering said inlet flows about said float means and between said arm parts thereof into the interior of the filter element and through the filter element and out said outlet.

4,388,192

PROCESS AND A DEVICE FOR PURIFYING WATER

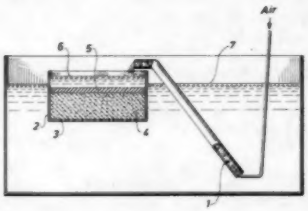
Ake O. V. Hellqvist, Djurhamn, Sweden, assignor to Cinderella AB, Stockholm, Sweden

Continuation of Ser. No. 79,015, Sep. 26, 1979, abandoned, which is a continuation of Ser. No. 961,902, Nov. 20, 1978, abandoned, which is a continuation of Ser. No. 853,667, Nov. 21, 1977, abandoned, which is a continuation of Ser. No. 660,889, Feb. 24, 1976, abandoned. This application Jun. 10, 1981, Ser. No. 272,150

Claims priority, application Sweden, Feb. 24, 1975, 7502057

Int. Cl.³ B01D *23/10*

U.S. Cl. 210—615 **18 Claims**



1. A process for purifying water by removing suspended particles which comprises passing the water through a filter of an inorganic filter material of the rock-wool type, said filter material being of a thickness of about 2 cm to below 1 m and having been prepared by melting an inorganic material and forming the melt of fibers, said melt having a composition of about 80% diabase mineral and about 20% lime, at least 90% of the fibers of said material having a diameter below 15 microns, the fiber solids content of the filter material being at most 20% of the volume, said fiber material in the fully soaked condition in the filter exhibiting a compression of less than 50% when subjected to an increase of a load acting on the surface of the filter material from a starting value of 50 grams/sq. inch to an increased value of 150 grams/sq. inch, and passing the water through the filter at a flow rate of above 10 meters per hour to remove said suspended particles.

9. A process according to claim 1, characterized by oxygenating said water prior to passing it into a filter thereby maintaining in the filter a biological layer formed by micro-organisms in the treated water.

4,388,193

METHOD AND APPARATUS FOR PERFORMING THIN-LAYER CHROMATOGRAPHY

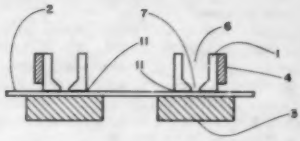
Paul Buncak, Bahnhofstrasse 31, CH-4106 Therwil, Switzerland

Filed Nov. 25, 1980, Ser. No. 210,437

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—658 **11 Claims**

1. Method for performing a thin-layer chromatographic analysis with a plate or sheet provided with a sorption layer, whereby a dissolved specimen to be analyzed is applied at a predetermined interval from a dosing surface and is broken down into its substances while a solvent is being supplied, characterized in that the solvent is conducted directly from a dosing container through an exit opening onto the sorption layer to a surface slit without capillary suction action being used; and further characterized in that after the development is



ended, the dosing container is filled with a reagent in order to make the contained materials visible, and the dosing container is moved relative to the TLC plate or sheet at a preselected pressure and speed, so that said plate or sheet is coated with the reagent.

4,388,194

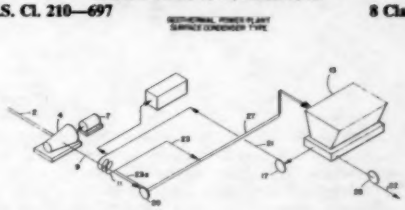
HYDROGEN SULFIDE ABATEMENT IN GEOTHERMAL STEAM SYSTEMS

William A. Hills, Lawrenceville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Sep. 4, 1981, Ser. No. 299,290

Int. Cl.³ C02C *1/40*; C02B *5/02*

U.S. Cl. 210—697 **8 Claims**



1. In the process of removing hydrogen sulfide from an aqueous waste stream including steam condensate from a geothermal power plant by treating the stream with an iron catalyst/hydrogen peroxide oxidant system, the improvement of preventing deposition of sludge comprising carrying out the treatment in the presence of an effective amount of a soluble polyphosphate selected from the class consisting of:

$M_4P_2O_7$	$M_3P_3O_{10}$	$(MPO_3)_n$
I	II	III
Pyrophosphate	Tripolyphosphate	Higher Polyphosphate

wherein M represents an alkali metal and n is an integer of from about 6 to 21.

4,388,195

PROCESS AND APPARATUS FOR THE CHEMICAL-MECHANICAL TREATMENT AND PURIFICATION OF GROUND WATERS, SURFACE WATERS AND EFFLUENTS

Gunter von Hagel, Aarbergen; Norbert Berlenbach, Wiesbaden-Dotzheim, and Gerhard Werner, Langenau, all of Fed. Rep. of Germany, assignors to Passavant-Werke Michelbacher Hutte, Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 54,900

Int. Cl.³ C02F *1/56*

U.S. Cl. 210—709 **18 Claims**

1. Process for the chemical-mechanical treatment and purification of ground water, surface waters and effluents, comprising the following steps:

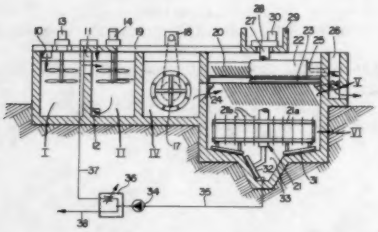
first passing the water being treated through a series of at

least three initial process stages which are carried out in initial zones, including:

(a) in a first initial process stage, which is carried out in a first initial zone, admixing at least one of the following materials with the water by means of stirring:
  (1) flocculants
  (2) flocculation aids
  (3) precipitants
  (4) agents conducive to sedimentations
  (5) agents for altering the pH value of the raw water in an amount effective in flocculating impurities from the water and forming sedimentable flocs;

(b) in a second initial process stage, which is carried out in a second initial zone, admixing contact sludge by means of stirring with the water; and

(c) in a third initial process stage, which is carried out in a third initial zone, admixing at least flocculant aids, using stirring energy input of more than 20 Watts per cubic meter of the reaction volume available in the zone of this initial process stage with a water retention time of no more than about 5 minutes;



then, after said initial process stages, a further process stage including flocculating said impurities and forming said sedimentable flocs, separating the flocs and reaction products and raw water components from the clarified water in a further zone separate from the said initial zones with separate removal of the separated solids, as sludge, and the clarified water from said further zone, with the separation of flocs and reaction products and raw water components from the clarified water in sedimentation equipment, and including concentrating at least a part of the sludge to a solids concentration of at least one percent weight volume and returning at least a part of the concentrated sludge as said contact sludge into said second initial process stage.

9. A process according to any one of claims 1 or 5, in which at least the solid concentration of the returned contact sludge and the amount of solids present in the raw water and remaining in the clarified water is measured, and including altering the volume of the contact sludge returned per unit time depending on at least one of these measured results.

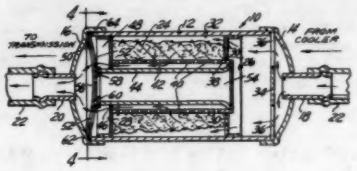
4,388,196

FILTER WITH HEAT CONTROLLED FLUID FLOW BYPASS

Carroll J. Lucia, Green Bay, Wis., assignor to Claude A. Patalidis, Southfield, Mich.

Continuation-in-part of Ser. No. 178,037, Aug. 14, 1980, Pat. No. 4,306,966. This application Apr. 21, 1981, Ser. No. 256,104
Int. Cl.³ B01D *35/02*
U.S. Cl. 210—742 **12 Claims**

1. A fluid filter comprising a housing having an inlet and an outlet, a filtering element disposed in said housing, means in said housing for directing said fluid from said inlet for passage through said filtering element, a bypass channelway through said filtering element in said housing placing said inlet in direct communication with said outlet, and thermostatically operated valving means closing said bypass channelway below a predetermined temperature for causing said fluid to flow through said filtering element and opening said bypass channelway to flow of fluid above said predetermined temperature, wherein said thermostatically operated valving means comprises a thermally deformable bimetallic disk peripherally attached to said housing and disposed proximate an end of said bypass channelway, said bimetallic disk being dished below said predetermined temperature such as to close said channelway end,



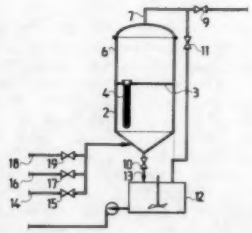
and said bimetallic disk being deformed at said predetermined temperature such as to open said channelway end, said bimetallic disk having an imperforate central portion engaged with said channelway end below said predetermined temperature and a perforate peripheral portion for passage therethrough of said fluid passing through said filtering element.

4,388,197

PROCEDURE FOR SEPARATING FINELY DIVIDED MATTER FROM A SUSPENSION BY FILTERING

Juha Lumikko, Savonlinna, Finland, assignor to Enso-Gutzeit Oy, Savonlinna, Finland

Filed May 28, 1981, Ser. No. 267,878
Claims priority, application Finland, May 29, 1980, 801741
Int. Cl.³ B01D *29/38*
U.S. Cl. 210—777 **3 Claims**



1. Improvement in a method of separating finely divided matter from a suspension by filtration in a periodically operated pressure filter unit including a filter tank having a roof, a filtrate collecting tank located above the filter tank, a plurality of filtering elements extending downwardly from the roof to the filter tank and the interior of the filtering elements communicating with the filtrate collecting tank, comprising the steps of introducing a lime sludge (or $CaCO_3$) into the filter tank, flowing the lime sludge under pressure through the filtering elements for depositing large-grain lime sludge on the exterior surface of the filtering elements within the filter tank while filtrate flows through the filtering elements into the filtrate collecting tank, flowing a green liquor containing sediment into the filter tank and passing the green liquor through the lime sludge layer on the exterior surface of the filtering elements and filtering the sediment in the green liquor on the lime sludge with the filtrate passing through the filtering elements into the filtrate collecting tank.

4,388,198

ANTI-RUST ADDITIVES AND COMPOSITIONS THEREOF

Richard A. Butcosk, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 5, 1979, Ser. No. 54,753
Int. Cl.³ C10M 1/10
U.S. Cl. 252—28 14 Claims

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor effective proportion of a rust or corrosion inhibitor prepared by reacting under suitable conditions a substituted succinic acid or succinic acid anhydride or the reaction product of a succinic acid or succinic acid anhydride, having an alkenyl radical containing from about 2 to 36 carbon atoms, and an amino acid with a metal hydroxide.

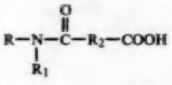
4,388,199

AQUEOUS RUST-INHIBITING AND LUBRICATING COMPOSITIONS

Ernesto Brandolese, Graffignana, Italy, assignor to Snamprogetti S.P.A., Milan, Italy

Continuation of Ser. No. 41,437, May 22, 1979, Pat. No. 4,273,664. This application Oct. 29, 1980, Ser. No. 201,819
Claims priority, application Italy, Jun. 2, 1978, 24135 A/78
Int. Cl.³ C10M 1/36
U.S. Cl. 252—33.6 1 Claim

1. An aqueous lubricating and rust-preventing composition containing from 0.5% to 50% by weight of the water-soluble amine salt prepared from an alkanolamine and a secondary or tertiary monoamide of monoamide-alkylene carboxylic acids having the general formula,



wherein R is an alkyl radical having from 1 to 18 carbon atoms, a phenyl group, a phenyl group substituted with F, Cl, Br or NO_2, or an alcoholic radical having from 2 to 5 carbon atoms; R_1 is hydrogen, an alkyl radical having from 1 to 4 carbon atoms, an alcoholic radical having from 2 to 5 carbon atoms, a polyoxyethylene group, a polyoxypropylene group, or a mixed oxyethyleneoxypropylene group having a degree of oxyethylation or oxypropylation, respectively, of from 1 to 20; and R_2 is an alkylene group having from 1 to 8 carbon atoms, or an alkenyl group, —CH=CH—, and from 0.1% to 20% by weight, realtive to the water-soluble amine salt, of water-soluble oxyethylated-oxypropylated polyglycols the balance being water.

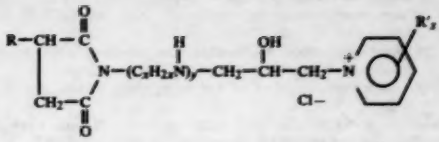
4,388,200

QUATERNARY AMMONIUM SALT COMPOSITION AND LUBRICATING OIL CONTAINING SAME

Phillip B. Valkovich, Spring, Tex., and Kenneth G. Hammond, Poughkeepsie, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,306
Int. Cl.³ C10M 1/32
U.S. Cl. 252—34 10 Claims

1. A quaternary ammonium salt composition represented by the formula:



in which R is a hydrocarbyl radical having from 25 to 200 carbon atoms, x is a number from 2 to 4, y has a value from 0 to 4, R′ is a hydrocarbyl radical having from 1 to 10 carbon atoms, and z is a number from 0 to 2.

4,388,201

CO-DISPERSANT STABILIZED FRICTION MODIFIER LUBRICATING OIL COMPOSITION

Darrell W. Brownawell, Scotch Plains; Harold Shaub, Berkeley Heights; Max J. Wisotsky, Highland Park, and Antonio Gutierrez, Mercerville, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 20, 1981, Ser. No. 284,739
Int. Cl.³ C10M 1/20, 1/26, 1/32, 1/54
U.S. Cl. 252—49.6 9 Claims

1. A storage stable lubricating oil composition having a reduced tendency to form sediment comprising a major portion of lubricating oil containing:

(a) 0.05 to 0.3 weight percent of a polycarboxylic acid-glycol ester friction modifier;

(b) 0.5 to 5.0 weight percent of a polyalkenyl succinimide or borated polyalkenyl succinimide dispersant and;

(c) a sediment reducing amount of a co-dispersant being an oil-soluble hydrocarbyl substituted mono- or bis-oxazoline or a hydrocarbyl substituted lactone oxazoline, said co-dispersant being present in an amount of from 25 to 75 weight percent of said (b) component dispersant and (d) metal containing additives which contribute to the tendency of the formulation to form sediment, the metal containing additives being (i) a neutral or basic phenate, sulfurized phenate or sulfonate detergent additive, present in an amount of from about 2 to 5 weight percent and (ii) a zinc dialkyl dithiophosphate anti-wear additive present in an amount of from about 1 to 3 weight percent.

4,388,202

LUBRICATING OIL COMPOSITION AND PROCESS FOR PREPARATION THEREOF

Riichiro Nagano, Yamaguchi, and Ryosuke Kaneshige, Ichihara, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP79/00289, § 371 Date Jul. 14, 1980, § 102(e) Date Jul. 14, 1980, PCT Pub. No. WO80/00976, PCT Pub. Date May 15, 1980
PCT Filed Nov. 13, 1979, Ser. No. 196,913
Claims priority, application Japan, Nov. 14, 1978, 53-139359; Nov. 14, 1978, 53-139362
Int. Cl.³ C10M 1/28
U.S. Cl. 252—52 A 20 Claims

1. A process for preparing a lubricating oil composition containing about 0.5 to about 40% by weight, based on the weight of the lubricating oil, of an oil-soluble graft copolymer, which comprises graft-copolymerizing in the presence of a radical initiator added thereto, a grafting monomer selected from the group consisting of

(a) saturated esters of unsaturated monocarboxylic acids,

(b) unsaturated esters of saturated carboxylic acids, and

(c) unsaturated epoxy compounds

with a lubricating oil and trunk copolymer selected from the group consisting of copolymers of alpha-olefins having 2 to 20 carbon atoms, and hydrogenated products of copolymers of

styrene and diolefins and/or alpha-olefins having 2 to 20 carbon atoms, said trunk copolymer having

(i) a number average molecular weight of about 5,000 to about 100,000,

(ii) a carbon-carbon double bond content determined from its iodine value of not more than about 0.1, and

(iii) an oxygen content of not more than about 0.3% by weight,

thereby to form said oil-soluble graft copolymer having grafted thereto about 10^{-2} to about 5 milliequivalents, per gram of the graft copolymer, of said grafting monomer.

20. A lubricating oil composition comprising a lubricating oil and about 0.5 to about 40% by weight, based on the weight of the lubricating oil, of an oil-soluble graft copolymer prepared by grafting in the presence of a radical intiator added thereto about 10^{-2} to about 5 milliquivalents, per gram of the oil-soluble copolymer formed, of a grafting monomer selected from the group consisting of

(a) saturated esters of unsaturated monocarboxylic acids,

(b) unsaturated esters of saturated carboxylic acids, and

(c) unsaturated epoxy compounds

to both said lubricating oil substrate and a trunk copolymer selected from the group consisting of copolymers of alpha-olefins having 2 to 20 carbon atoms, copolymers of styrene and alpha-olefins having 2 to 20 carbon atoms and hydrogenated products of copolymers of styrene and diolefins, said trunk copolymer having

(i) a number average molecular weight of about 5,000 to about 100,000,

(ii) a carbon-carbon double bond content determined from its iodine value of not more than about 0.1 milliequivalent/g of copolymer, and

(iii) an oxygen content of not more than about 0.3% by weight.

4,388,203

COMPOSITION AND METHOD FOR MELTING FROZEN AQUEOUS SOLUTIONS

Kenneth H. Nimerick, Tulsa, and Claude T. Copeland, Broken Arrow, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 20, 1981, Ser. No. 323,158

Int. Cl.³ C09K *3/18*

U.S. Cl. 252—70 **10 Claims**

1. A method of thawing frozen water which comprises applying to the surface of frozen water a composition comprising: at least one component from each of the following water soluble components (1), (2) and/or (3) comprising (1) a polyhydroxy compound or monoalkyl ether thereof, (2) an organic nonvolatile compound having at least one hydrophilic group, (2) being different from (1), (3) an organic salt which functions to reduce the freezing point of water, (4) an organic polymer which functions to increase the viscosity and tackiness of the composition, and (5) water.

4,388,204

THICKENED ALKALI METAL HYPOCHLORITE COMPOSITIONS

Harold L. Dimond, Cincinnati, Ohio, and Thomas J. Murphy, Florence, Ky., assignors to The Drackett Company, New York, N.Y.

Filed Mar. 23, 1982, Ser. No. 361,031

Int. Cl.³ C11D *3/395, 7/52*

U.S. Cl. 252—98 **22 Claims**

1. A mixed anionic surfactant composition capable of thickening an aqueous solution of an alkali metal hypochlorite, said composition comprising a thickening additive consisting essentially of a mixture of

(A) at least one alkali metal sulfate salt of an ethoxylated aliphatic alcohol in an amount of from about 3 to about 40 percent by weight, based on the total weight of (A), (B) and (C), and

(B) at least one alkali metal salt of an N-alkyl, N-fatty acyl amino acid in an amount of from about 10 to about 50 percent by weight, based on the total weight of (A), (B) and (C), and

(C) at least one alkali metal salt of an alkyl sulfate in an amount of from about 30 to about 75 percent by weight based on the total weight of (A), (B) and (C).

4,388,205

PHOSPHATE-FREE CLEANING COMPOSITIONS

Hans Stettler; Karl Buser, both of Basel, Switzerland, and Jean-Pierre Chavannes, Saint-Louis, France, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 310,997, Oct. 13, 1981, abandoned. This application Nov. 6, 1981, Ser. No. 318,691

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 3038434

Int. Cl.³ C11D *3/08, 7/26, 10/02*

U.S. Cl. 252—135 **20 Claims**

1. A phosphate-free aqueous composition comprising

(A) 100 parts by weight of a polycarboxylic acid in the salt form

(B) 2 to 400 parts by weight of an alkali metal gluconate or glucoheptonate

(C) 20 to 700 parts by weight of an alkali metal metasilicate, and

(D) 10 to 150 parts by weight of an alkali metal hydroxide.

4,388,206

CORROSION INHIBITORS

Eugene V. Hort, Wayne; Lowell R. Anderson, Morristown, and Dru W. Alwani, Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.

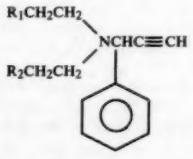
Filed Dec. 1, 1981, Ser. No. 326,236

Int. Cl.³ C11D *7/00;* C23G *1/06;* C04B *9/02*

U.S. Cl. 252—148 **15 Claims**

1. An aqueous composition for inhibiting the corrosion of metals placed therein comprising:

(a) an effective amount of a corrosion-inhibiting compound having the formula:



where R_1 and R_2 are independently alkyl C_1–C_6; and

(b) a non-oxidizing acid.

4,388,207

PROCESS OF AUGMENTING THE AROMA OF DETERGENTS USING METHYL SUBSTITUTED NORBORNANE CARBOXALDEHYDE DIMETHYL ACETALS OR NORBORNENE CARBONITRILES

Philip T. Klemarczyk, Old Bridge; James M. Sanders, Eatontown; Manfred H. Vock, Locust; Joaquin F. Vinals, Rumson; Frederick L. Schmitt, Holmdel, and Edward J. Granda, Englishtown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

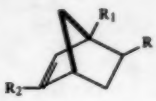
Division of Ser. No. 284,108, Jul. 16, 1981, Pat. No. 4,346,243, which is a continuation-in-part of Ser. No. 247,323, Mar. 25, 1981, Pat. No. 4,326,998, which is a continuation-in-part of Ser. No. 152,187, May 22, 1980, Pat. No. 4,284,824. This application Apr. 6, 1982, Ser. No. 366,081

Int. Cl.³ C11D *3/50, 9/44*

U.S. Cl. 252—174.11 **1 Claim**

1. The process for augmenting or enhancing the aroma of a solid or liquid anionic, cationic, nonionic or zwitterionic deter-

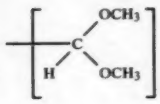
gent comprising the step of adding to a solid or liquid anionic, cationic, nonionic or zwitterionic detergent base an aroma augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein R represents the nitrile moiety having the structure:

[C≡N]

or the dimethoxymethyl moiety having the structure:



and wherein one of R_1, or R_2 is methyl and the other of R_1 or R_2 is hydrogen.

4,388,208

ALUMINIUM SULPHATE COMPOSITION FOR WATER-PURIFYING, PAPER-SIZING AND PLANT DEWATERING PURPOSES AND A METHOD FOR PRODUCING THE COMPOSITION

Ulla B. Gytel, Villa Linnea, Ramlösa Brunns Park, S-25367 Helsingborg, Sweden

Filed Mar. 11, 1982, Ser. No. 357,176
Claims priority, application Sweden, Mar. 23, 1981, 8101830
Int. Cl.³ C02F 5/02, 5/08; C01F 7/74
U.S. Cl. 252—175 **9 Claims**

1. An aluminium sulphate composition for water-purifying, paper-sizing retention of filler and fibers in papermaking and plant-dewatering purposes, comprising an aqueous solution of aluminium sulphate containing polynuclear complexes of the kind

$$Al_m(OH)_n^{(3m-n)+}$$

in which m and n are positive integers, characterized in that said composition has a total aluminium content, Al_{tot}, of between about 0.2 and about 2 mole per liter; and that it is a clear, stable solution comprising polynuclear complexes determined by the associated values

Mole Al per liter	Mole Ratio OH/Al
0.2	1.5
0.5	1.1–1.6
1.0	0.8–1.7
1.9	0.35–1.5
2.0	0.3–1.4

4,388,209

POLYGLYCIDYL ETHERS

Edgar R. Rogier, Minnetonka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Division of Ser. No. 81,950, Oct. 4, 1979, Pat. No. 4,339,389. This application Mar. 27, 1981, Ser. No. 248,104
Int. Cl.³ C07D 303/26, 303/27; C08K 5/15; C09K 3/00
U.S. Cl. 252—182 **10 Claims**

1. The polyglycidyl ether of a polyol containing on average more than 1.5 oxirane units per molecule selected from the group consisting of:

$$CH_3(CH_2)_m[C(CH_2OH)_2]_n(CH_2)_p[C(CH_2OH)_2]_q(CH_2)_r[C(CH_2OH)_2]_s(CH_2)_tCH_2OH$$

and mixtures thereof: wherein n plus q plus s are integers the sum of which is from 1 to 3; t is 3 or greater; n, q and s are 0 or 1; and m through t are integers the sum of which is from 12 to 20.

2. The composition of claim 1 containing as an additional ingredient the polyglycidyl ether of a polyol containing on average more than 1.5 oxirane units per molecule selected from the group consisting of:

$$H(CH_2)_kCH(CH_2OH)(CH_2)_hCH_2OH$$

where k is 3 or greater; and h plus k are non-zero integers the sum of which is from 12 to 20.

4,388,210

HIGH SURFACE AREA LEAD OXIDE COMPOSITE AND METHOD FOR MAKING THE SAME

G. Anthony Parker, Cheswick, Pa., assignor to St. Joe Minerals Corporation, New York, N.Y.

Continuation of Ser. No. 95,155, Nov. 19, 1979, abandoned, which is a continuation of Ser. No. 920,689, Jun. 30, 1978, abandoned. This application Oct. 8, 1981, Ser. No. 309,803
Int. Cl.³ C01G 21/02; H01M 4/56
U.S. Cl. 252—182.1 **34 Claims**

1. In a method for preparation of a high surface area lead oxide composite, the steps of:

(a) preselecting starting material comprised of a lead oxide or lead sub-oxide;

(b) admixing said starting material and a liquid medium containing a hydrogen bonding solvent; and

(c) subjecting such mixture to a gaseous flow constituted inclusive of ozone to precipitate from said mixture a composite of lead oxide and lead dioxide having an increased surface area relative to said starting material.

4,388,211

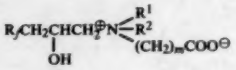
Patent Not Issued For This Number

4,388,212
REDUCING SURFACE TENSION WITH N-TYPE BETAINES OF 2-HYDROXYL-1,1,2,3,3-PENTAHYDROPERFLUOROALKYLAMINES

John W. Richter, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 92,767, Nov. 9, 1979, Pat. No. 4,283,533.
This application May 6, 1981, Ser. No. 260,609
Int. Cl.³ B01F *17/28;* **C07D** *265/30*
U.S. Cl. 252—356 **6 Claims**

1. A process for reducing surface tension in aqueous systems comprising adding thereto an effective amount of an amphoteric N-type betaine or a mixture of N-type betaines represented by the formula:



wherein

R_f is C_4–C_{20} perfluoroalkyl;

R^1 and R^2 are methyl or, together with the N atom to which they are bonded, form a piperidino, morpholino, or N-alkyl(C_1–C_4)piperazino; and

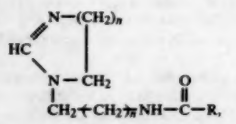
m is a whole number between 1 and 4.

4,388,213
CYCLIC AMIDINE BASED CORROSION INHIBITORS WHICH INHIBIT CORROSION CAUSED BY CO_2 AND H_2S

Knut Oppenlaender, Ludwigshafen; Karl Stork, Lampertheim, and Klaus Barthold, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,634
Int. Cl.³ C23F *11/1*
U.S. Cl. 252—392 **5 Claims**

1. A composition of matter having the following structural formula:



in which R represents a C_7- to C_{25}-alkyl or alkenyl radical and in which n represents the numbers 1 or 2.

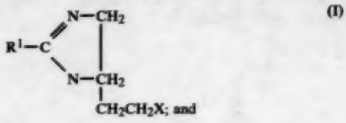
4,388,214
IMIDAZOLINE BASED CORROSION INHIBITORS WHICH INHIBIT CORROSION CAUSED BY CO_2 AND H_2S

Knut Oppenlaender, Ludwigshafen; Karl Stork, Lampertheim, and Klaus Barthold, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,635
Int. Cl.³ C23F *11/14, 11/12*
U.S. Cl. 252—392 **6 Claims**

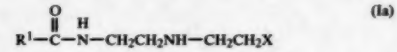
1. A corrosion inhibitor comprising the reaction product of (A) a compound selected from the group consisting of

(1) an imidazoline or salt thereof having the following structural formula



(I)

(2) a precursor thereof having the following structural formula:

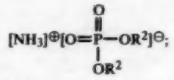


(Ia)

wherein

R^1 is a C_6 to C_{22} alkyl or alkenyl radical;

X is OH, NH_2, or



and

R^2 is a C_4 to C_{18} alkyl radical; and

(B) elementary sulfur;

wherein (A) and (B) are reacted at 100° C. to 200° C. within 1 to 3 hours in a weight ratio of (A) to (B) of 100:1 to 2:1.

4,388,215
WOOD PRESERVATIVE COMPOSITION

Hideo Ishida; Masashi Kitada, and Keisaku Ihara, all of Honjo, Japan, assignors to Sanyo Mokuzai Bofu Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1981, Ser. No. 328,503
Claims priority, application Japan, Dec. 12, 1980, 55-174711
Int. Cl.³ B27K *3/40;* **C09K** *15/14*
U.S. Cl. 252—402 **5 Claims**

1. A wood preservative composition comprising 2-mercaptobenzothiazole or its salt and 2,5-dichloro-4-bromophenol or its salt.

4,388,216
REGENERATING HEAVY METAL CATALYSTS FOR BUTYNEDIOL PRODUCTION

Helmut Westernacher, Haltern, Fed. Rep. of Germany, and Franz Schämann, deceased, late of Marl, Fed. Rep. of Germany (by Elfriede Schämann, Ilka Schämann, heirs), assignors to GAF Hüls Chemie GmbH, Marl, Fed. Rep. of Germany

Filed Jul. 21, 1980, Ser. No. 171,000
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929586
Int. Cl.³ B01J *31/40, 23/94;* **C07C** *33/046, 29/00*
U.S. Cl. 252—412 **6 Claims**

1. In a process for regenerating suspended heavy metal

catalysts comprising a finely divided water insoluble complex cuprous acetylide powder made from a catalyst precursor material containing greater than 20% and less than 35% by weight of copper and 0 to about 3% by weight of bismuth on a magnesium silicate carrier support for the synthesis of butynediol from acetylene and formaldehyde in a reaction mixture thereof, the improvement comprising:

(a) removing an aqueous catalytic slurry containing said supported heavy metal catalysts from said reaction mixture;

(b) raising the removed slurry to a temperature of about 200° to 500° C.; and

(c) maintaining said slurry at said temperature with air being supplied until the carbon content of said supported heavy metal catalysts is reduced to about 0.5 to 3% to form carbon reduced supported catalysts.

5. The process of claim 1, wherein step (c) is carried out by revolving said supported heavy metal catalysts to eliminate local overheating.

6. The process of claim 5, wherein said carbon reduced supported catalysts produced by step (c) are reactivated by introducing said catalysts into a formaldehyde solution to form a dispersion, adding acetic acid to said dispersion and treating with acetylene.

4,388,217

PROCESS FOR THE RECOVERY OF CATALYST VALUES

Robert T. Hembre, and Steven L. Cook, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 209,798, Nov. 24, 1980, abandoned. This application Sep. 23, 1981, Ser. No. 304,773

Int. Cl.³ B01J *31/40, 23/96;* **C07C** *51/10;* **C01G** *55/00*

U.S. Cl. 252—413 **4 Claims**

1. Process for the recovery of catalyst values from a catalyst-tar solution derived from a production system in which acetic anhydride is prepared by carbonylating methyl acetate in the presence of rhodium, lithium and methyl iodide wherein the catalyst-tar solution is submitted to an extraction using methyl iodide and aqueous hydrogen iodide and recovering catalyst values in the aqueous phase.

2. Process according to claim 1 wherein the pH of the aqueous hydrogen iodide phase is about 1 or less.

3. Process for the removal of tar from a production system in which acetic anhydride is prepared by carbonylating methyl acetate in the presence of rhodium, lithium and methyl iodide which comprises the steps of:

(1) forming a concentrated catalyst-tar solution containing catalyst values dissolved therein and derived from the production system;

(2) submitting the catalyst-tar solution to an extraction using methyl iodide and aqueous hydrogen iodide to obtain a methyl iodide phase containing tar and an aqueous phase containing catalyst values; and

(3) feeding the aqueous phase to the production system,

whereby rhodium is maintained in its catalytically-active, water-soluble form to avoid loss of rhodium during the tar removal process.

4,388,218

REGENERATION OF CRACKING CATALYST IN TWO SUCCESSIVE ZONES

Frederick Rowe, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 924,065, Jul. 12, 1978, abandoned. This application Sep. 22, 1981, Ser. No. 304,675

Claims priority, application United Kingdom, Jul. 28, 1977, 31758/77

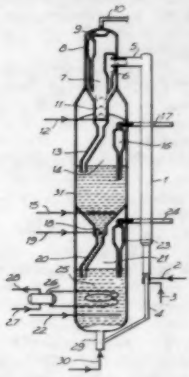
Int. Cl.³ B01J *21/20, 29/38;* **C10G** *11/18*

U.S. Cl. 252—417 **3 Claims**

1. A process for treating solid particles of partially or completely deactivated cracking catalyst which process comprises:

(1) passing said solid particles into a first fluidized bed reactor and therein contacting the solid particles at elevated temperatures with a first gas stream consisting essentially of (a) oxygen plus steam, (b) oxygen plus carbon dioxide, or (c) oxygen plus steam plus carbon dioxide and adjusting the ratio of oxygen to steam and/or carbon dioxide so that some carbon is removed form the solid particles without major net evolution of heat in the first reactor, thereby partially regenerating the said cracking catalyst particles to produce synthesis gas containing a mixture of steam, carbon monoxide, carbon dioxide and hydrogen, and thereafter

(2) passing the thus-treated solid particles from the base of said first fluidized bed reactor downwardly by gravity to the top of a second fluidized bed reactor and therein contacting the solid particles at elevated temperature with



a second gas stream comprising oxygen thereby substantially completely regenerating the said cracking catalyst particles and removing the regenerated catalyst from the base of the second fluidized bed reactor, provided that the first fluidized bed reactor is disposed substantially vertically above the second fluidized bed reactor located within one vessel,

the contacting and the reactions occurring in both reactors being controlled so that there is no major evolution of heat from either reactor.

2. A process as claimed in claim 1 in which the solid particles are discharged from the second zone at a temperature which is substantially the same as that used in a catalytic cracking process.

3. A process as claimed in claim 1 in which the second gas stream comprising oxygen is an air stream.

4,388,219

CATALYST FOR POLYMERIZING ETHYLENE, COMPRISING COMPOUNDS OF SEVERAL TRANSITION METALS, AND A POLYMERIZATION PROCESS USING SAID CATALYST

Karel Bujadoux, Lens, France, assignor to Societe Chimique des Charbonnages - CdF CHIMIE, Paris, France

Filed Dec. 19, 1980, Ser. No. 218,095

Claims priority, application France, Dec. 28, 1979, 79 31911

Int. Cl.³ B01J *21/02*

U.S. Cl. 252—429 C **10 Claims**

1. A catalyst for polymerizing ethylene comprising at least two halogen compounds of transition metals, one of which is a titanium trichloride syncrystallized with aluminium chloride, having the formula:

$$(TiCl_3, \tfrac{1}{3}AlCl_3)(MX_3)_x(MgX_2)_y$$

wherein $0.3 \leqq x \leqq 3$, $0 \leqq y \leqq 20$, M is a transition metal of group V B and VI B of thhe Periodic system and X is a halogen.

4,388,220

TRANSITION METAL COMPOSITION, PRODUCTION AND USE

Angus J. Hartshorn, Runcorn; Eric Jones, Tarporley, and John A. Segal, Welwyn Garden City, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 13, 1981, Ser. No. 282,954

Claims priority, application United Kingdom, Jul. 14, 1980, 8022948; May 15, 1981, 8114987

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **10 Claims**

1. A transition metal composition which is the product of treating at least one particulate support material, with

(a) at least one organomagnesium compound of formula R^1MgR^2 in which R^1 and R^2, which may be the same or different, are hydrocarbyl groups,

(b) at least one agent which is (a) capable of reacting with the product obtained by treating the at least one particulate support material with the at least one organomagnesium compound to cleave at least a proportion of the carbonmagnesium bonds in the said product, and (b) does not form a magnesium-halide during the cleavage reaction, and

(c) at least one transition metal compound of Groups IVA, VA or VIA of the Periodic Table,

with the proviso (i) that the at least one particulate support material is treated with (a) the at least one organomagnesium compound R^1MgR^2 and then with the at least one cleavage agent or (b) the at least one cleavage agent and then with the at least one organomagnesium compound R^1MgR^2 or (c) a mixture, or at least a notional product of a reaction, of the at least one organomagnesium compound R^1MgR^2 and the at least one cleavage agent prior to being treated with the at least one transition metal compound of Groups IVA, VA or VIA of the Periodic Table, and (ii) that the at least one cleavage agent does not consist of a halogenating agent and a Lewis Base.

4,388,221

VANADIUM-PHOSPHORUS-TIN-MORDENITE OXIDATION CATALYSTS

Eric L. Moorehead, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 3, 1981, Ser. No. 289,806

Int. Cl.³ B01J *27/14*

U.S. Cl. 252—435 **31 Claims**

1. An oxidation catalyst described by the formula:

$$V_aP_bSn_cO_dX$$

wherein X is mordenite, a is 0.10 to 1, b is 1, c is 0.001 to 0.30, and d is a number which satisfies the valence requirements of the other elements present.

4,388,222

NI/CO MO P ON TITANIA-ALUMINA HYDRODESULFURIZING CATALYST

Geoffrey Wilson, Westlake Village, and Masami Kayamoto, Whittier, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 874,752, Feb. 3, 1978, abandoned, and a continuation-in-part of Ser. No. 874,753, Feb. 3, 1978, Pat. No. 4,196,101, each is a continuation-in-part of Ser. No. 671,333, Mar. 29, 1976, abandoned. This application Jun. 7, 1979, Ser. No. 46,466

The portion of the term of this patent subsequent to Apr. 1, 1997, has been disclaimed.

Int. Cl.³ B01J *21/04, 23/85, 23/88, 27/18*

U.S. Cl. 252—437 **21 Claims**

1. A hydrodesulfurizing catalyst in the form of an anhydrous pellet comprising a substrate, said substrate consisting essentially of an intimate mixture of alumina and an oxide of a Group IV-B metal, the substrate being further associated with an oxide of a Group VI-B metal, said Group VI-B metal being selected from molybdenum or tungsten, and an oxide of Group VIII metal, the catalyst also containing phosphorous in a complex with molybdenum or tungsten.

4,388,223

CATALYST FOR THE CONVERSION OF UNSATURATED HYDROCARBONS INTO DIOLEFINS OR UNSATURATED ALDEHYDES AND NITRILES, AND PROCESS FOR PREPARING THE SAME

Natale Ferlazzo, Segrate; Natale Bertolini, Milan, and Marcello Ghirga, Bresso, all of Italy, assignors to Euteco Impianti S.p.A., Milan, Italy

Filed Apr. 6, 1981, Ser. No. 251,434

Int. Cl.³ B01J *23/10, 23/34, 23/86, 23/88*

U.S. Cl. 252—437 **19 Claims**

1. A catalyst active and selective in the conversation of unsaturated hydrocarbons into diolefins and unsaturated nitriles and aldehydes, which comprises:

a crystalline phase (I) consisting of one or more molybdates of the monoclinic system, selected from the group consisting of ferric molybdate, an aluminum molybdate isomorph of ferric molybdate, a cerium molybdate isomorph of ferric molybdate, and a chromium molybdate isomorph of ferric molybdate; and

a crystalline phase (II) consisting of one or more molybdates belonging to the monoclinic system, selected from the group consisting of alpha manganese molybdate, a beta cobalt molybdate isomorph of alpha manganese molybdate, a beta nickel molybdate isomorph of alpha manganese molybdate, a zinc molybdate isomorph of alpha manganese molybdate, a magnesium molybdate isomorph of alpha manganese molybdate, and a cadmium molybdate isomorph of alpha manganese molybdate,

wherein the molar ratio between the molybdates of phase (I) and molybdates of phase (II) is from 0.1:1 to 5:1, and

one or more promotor chemical elements selected from the group consisting of selenium, tellurium, arsenic, antimony, bismuth, vanadium, niobium, tin, lead and thallium, homogenously distributed with said crystalline phases (I) and (II) with distortion of the structure of said phases and without creating new further phases wherein the atomic ratio between said promotor elements and the sum of said bivalent and trivalent elements of phases (I) and (II) in said catalyst is from 0.01:1 to 1.0:1.

4,388,224

MOLYBDENUM-EXCHANGED CRYSTALLINE ALUMINOSILICATE ZEOLITE

Eric L. Moorehead, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 81,005, Oct. 2, 1979, Pat. No. 4,297,243. This application Jul. 23, 1981, Ser. No. 286,359

Int. Cl.³ B01J *29/16, 29/26, 29/36*

U.S. Cl. 252—455 Z **25 Claims**

24. A catalyst composition comprising a calcined, intimate admixture of (1) one or more hydrogenation components selected from the group consisting of uranium and the Group VIB and Group VIII metals and the compounds thereof, and (2) a crystalline aluminosilicate zeolite containing molybdenum-containing cations in ion-exchangeable form.

25. A catalyst composition comprising a sulfided, intimate admixture of (1) one or more hydrogenation components selected from the group consisting of uranium and the Group VIB and Group VIII metals and the compounds thereof and (2) a crystalline aluminosilicate zeolite containing molybdenum-containing cations in ion-exchangeable form.

4,388,225

OLEFIN OXIDATION WITH SUPPORTED CUO CATALYST

Paul W. Solomon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 228,037, Jan. 23, 1981, Pat. No. 4,337,364. This application Dec. 31, 1981, Ser. No. 336,208

Int. Cl.³ B01J 23/72, 21/04

U.S. Cl. 252—463 2 Claims

1. A method for producing a catalyst comprising (1) impregnating a support with an aqueous solution of cupric oxide, (2) subjecting the impregnated support to a temperature in the range of about 90° C. to about 150° C. for a time sufficient to produce a dry powder thereby providing a support impregnated with about 0.1 to about 5 weight percent cupric oxide.

4,388,226

PREPARATION OF MIXED OXIDE CATALYSTS COMPRISING THE OXIDES OF MOLYBDENUM AND/OR TUNGSTEN

Jean-Yves Derrien, Bourg-la-Reine, and Paul Belon, Ales, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Oct. 30, 1981, Ser. No. 316,896

Claims priority, application France, Nov. 28, 1980, 80 25261

Int. Cl.³ B01J 23/82, 23/84, 23/85, 23/88

U.S. Cl. 252—470 10 Claims

1. A process for the preparation of a mixed oxide active catalyst having the formula:

$$A_aMo_cW_dCo_eB_bO_x$$

wherein:

A is at least one of the metals selected from nickel, manganese and lead;

B is at least one of the metals selected from iron, bismuth, chromium and thallium;

a is the sum of the values indicating the amounts present of each of the metals A, and is a number ranging from greater than or equal to 0 to about 4;

c and d are numbers each equal to or greater than 0 and ranging to 12, with the sum c+d being about 12;

e is a number ranging from about 8 to about 12;

b is the sum of the values indicating the amounts present of each of the metals B, and is a number ranging from greater than 0 to about 1.5 [(c+d)−(a+e)]; and

x is a number satisfying all unbalanced valences,

said process comprising, in a first stage, intimately admixing in aqueous phase the salts of all metals to comprise such active catalyst, with the salts of molybdenum and/or tungsten being ammonium salts and at least one salt of at least one of the metals A and B being a nitrate, and further wherein such first stage said intimate admixing comprises acidifying said first aqueous solution comprising said ammonium salts of molybdenum and/or tungsten in amounts sufficient to satisfy the values c and d to such extent as to adjust the pH thereof to a value ranging from about 0.5 to 3, separating the precipitate which forms thereby and forming an aqueous suspension thereof, next adding to said suspension a second aqueous solution comprising said A and B metal salts in amounts sufficient to satisfy the values a and b and, serially thereafter, also adding thereto cobalt carbonate, in powder form, in an amount sufficient to satisfy the value e, and thence concentrating the suspension which results to obtain a paste of the desired active catalyst; and, in a second stage, then drying said paste and, at least once, calcining same.

4,388,227

INTERCALATION OF GRAPHITIC CARBON FIBERS

Ilmar L. Kalnin, Millington, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 2, 1979, Ser. No. 17,006

Int. Cl.³ D01F 6/18, 9/14

U.S. Cl. 252—510 27 Claims

1. In a process for the formation of an intercalated carbonaceous fibrous material of increased electrical conductivity wherein a carbonaceous fibrous material containing at least 90 percent carbon by weight which incorporates turbostratic graphitic carbon and is derived from a fibrous material of an acrylonitrile homopolymer or an acrylonitrile copolymer containing at least about 98 mole percent of acrylonitrile units and up to about 2 mole percent of one or more other monovinyl units copolymerized therewith is contacted with at least one electron acceptor intercalating agent; the improvement of providing said carbonaceous fibrous material prior to said intercalation in a modified form as evidenced by the ability to exhibit resolved graphitic Miller index (100) and (101) reflections and a (112) reflection when subjected to wide-angle x-ray diffraction analysis.

9. In a process for the formation of an intercalated carbonaceous fibrous material of increased electrical conductivity wherein a carbonaceous fibrous material derived from an acrylic fibrous material containing at least 90 percent carbon by weight which incorporates turbostratic graphitic carbon is contacted with at least one electron acceptor intercalating agent; the improvement comprising selecting a carbonaceous fibrous material which is derived from a fibrous material of an acrylonitrile homopolymer or an acrylonitrile copolymer containing at least about 98 mole percent of acrylonitrile units and up to about 2 mole percent of one or more other monovinyl units copolymerized therewith, and which has been heated in a non-oxidizing atmosphere at a temperature in the range of at least 3000° C. up to approximately 3500° C. while at a pressure sufficient to prevent destruction of the original fibrous configuration prior to contact with said intercalating agent whereby the structure thereof is modified and rendered capable of undergoing intercalation to form an intercalated fibrous product of increased electrical conductivity.

19. An intercalated carbonaceous fibrous material exhibiting a specific electrical resistivity no greater than that of copper formed by (a) heating a carbonaceous fibrous material containing at least 90 percent carbon by weight derived from a fibrous material of an acrylonitrile homopolymer or an acrylonitrile copolymer containing at least about 98 mole percent of acrylonitrile units and up to about 2 mole percent of one or more other monovinyl units copolymerized therewith which incorporates turbostratic graphitic carbon and exhibits the usual unresolved graphitic Miller index (100, 101) doublet reflection and the absence of a (112) reflection when subjected to wide-angle x-ray diffraction analysis in a non-oxidizing atmosphere at a temperature in the range of at least 3000° C. up to approximately 3500° C. while at a pressure sufficient to prevent destruction of the original fibrous configuration whereby the structure thereof is modified and rendered capable of exhibiting resolved graphitic Miller index (100) and (101) reflections and the presence of a (112) reflection when subjected to wide-angle x-ray diffraction analysis, and (b) contacting said previously modified carbonaceous fibrous material with at least one electron acceptor intercalating agent capable of imparting said specific electrical resistivity.

4,388,228

MIXTURE OF ALIPHATIC C_{10} BRANCHED OLEFIN EPOXIDES AND USE THEREOF IN AUGMENTING OR ENHANCING THE AROMA OF PERFUMES AND/OR ARTICLES

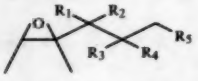
Richard M. Boden, Monmouth Beach; Lambert Dekker, Holmdel; Frederick L. Schmitt, Holmdel, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 195,630, Oct. 9, 1980, Pat. No. 4,335,009, which is a continuation-in-part of Ser. No. 160,788, Jun. 19, 1980, Pat. No. 4,287,084. This application Feb. 18, 1982, Ser. No. 350,095

Int. Cl.³ A61K 7/46

U.S. Cl. 252—522 R 6 Claims

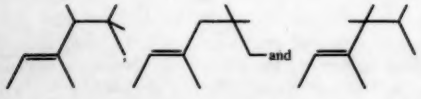
1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions and colognes comprising the step of adding to a perfume composition or a cologne base an aroma augmenting or enhancing amount of an epoxide compound defined according to the structure:



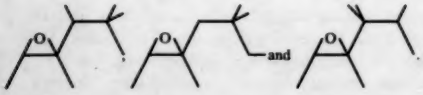
wherein R_1, R_2, R_3, R_4 and R_5 are the same or different and each represents hydrogen or methyl with the proviso that (i) the sum total of carbon atoms in R_1, R_2, R_3, R_4 and R_5 is three, and (ii) R_1 and R_2 represent hydrogen when R_5 represents methyl, and (iii) when either R_1 or R_2 is methyl, R_5 is hydrogen.

5. A process for augmenting or enhancing the aroma of consumable materials selected from the group consisting of perfume compositions and colognes comprising the step of adding to a perfume composition or a cologne base, at least one epoxide compound-containing composition produced according to the process comprising the steps of reacting isoamylene having the structure:

with a Lewis acid or a mineral acid to form a mixture of diisoamylenes defined according to the structures:



and then reacting the said mixture of diisoamylenes with a peracid in order to form a mixture of epoxides having the structures:



4,388,229

CONTACT LENS REJUVENATING SOLUTION

Cherng-Chyi Fu, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Nov. 2, 1981, Ser. No. 317,656

Int. Cl.³ C11D 1/72, 7/48

U.S. Cl. 252—549 41 Claims

1. An aqueous contact lens solution for removing adsorbed and occluded chemical and biological agents from a contact lens in need of rejuvenation which comprises:

(a) a nonionic surfactant;

(b) (i) a cationic ion exchange resin,

(ii) an anionic ion exchange resin or

(iii) mixtures of (i) and (ii);

(c) water; and optionally

(d) an ophthalmologically suitable salt.

4,388,230

Patent Not Issued For This Number

4,388,231

PROCESS FOR EXTRACTION OF IODINE

Lucien Person, Levallois-Perret, France, assignor to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

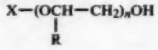
Filed Jan. 24, 1980, Ser. No. 115,076

Claims priority, application France, Mar. 30, 1979, 79 08004

Int. Cl.³ G21F 9/12, 9/06

U.S. Cl. 252—631 8 Claims

1. The process for the selective liquid-liquid extraction of iodine from an aqueous solution containing the same without forming a precipitate, comprising adding to said solution an iodine solvent comprising ether groups, having a non-ionic hydrophobic character, of the general formula:



in which R is a methyl and/or ethyl group, n is a number from 1 to 200, and X is the remainder of an hydrophobic compound which comprises at least one reactive hydrogen atom and recovering the iodine from the solvent.

4,388,232

METHOD OF PRODUCING PLASMA FRACTIONS FREE OF SIDE-EFFECTS USING FAST-REACTING ANTITHROMBIN

Johann Eibl; Fritz Elsinger, and Yendra Linnau, all of Vienna, Austria, assignors to Immuno Aktiengesellschaft für Chemisch Medizinische Produkte, Vienna, Austria

Continuation-in-part of Ser. No. 135,234, Mar. 31, 1980, abandoned. This application May 5, 1982, Ser. No. 375,044

Claims priority, application Austria, Apr. 19, 1979, 2940/79

Int. Cl.³ C07G 7/00

U.S. Cl. 260—112 B 12 Claims

1. A method of producing plasma fractions free of side-effects, by purification and step-wise enrichment of plasma pro-

teins, by a technique selected from the group consisting of filtration, cryoprecipitation, precipitation, adsorption, ultrafiltration, centrifugation and lyophilization, in the presence of calcium-binding anticoagulants, which method comprises the purification and enrichment of the plasma proteins, in the presence of fast reacting (avid) antithrombin, while maintaining a concentration of the fast reacting (avid) antithrombin of 0.05 to 50 units per ml of the respective solution during all fractionation-process steps.

4,388,233

SYNTHETIC SUBSTRATES FOR ENZYME ANALYSIS

Eugene R. Bissell, Alamo; Alexander R. Mitchell, Livermore; Karen W. Pearson, Livermore, and Robert E. Smith, Livermore, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

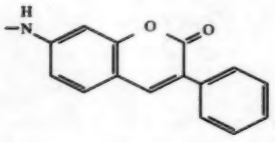
Filed May 15, 1981, Ser. No. 264,118
Int. Cl.³ C07C *103/52*; C07D *311/06*
U.S. Cl. 260—112.5 R **1 Claim**

1. A synthetic substrate, useful for enzyme analysis, represented by A-D comprising:

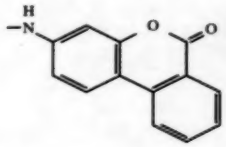
an A moiety and a D moiety, said A and D moieties of said A-D bonded together by an enzyme hydrolyzable bond, said A moiety selected from the group consisting of Leu, Ala, Arg, Lys-Ala, Gly-Gly-Arg, salt forms thereof and blocking groups thereon,

said A moiety determining an enzyme specificity of at least one enzyme for said synthetic substrate,

said D moiety being a coumarin derivative defining a 3 position carbon and a 4 position carbon and having an electron withdrawing group substituted at said 3 position carbon or fused at said 3 and 4 position carbons and selected from the group consisting of



and



4,388,234

PEPTIDE ISOLATION

Bernard L. Horecker, New York, N.Y., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 28, 1981, Ser. No. 335,001
Int. Cl.³ C07C *103/52*; A61K *37/02*
U.S. Cl. 260—112.5 R **24 Claims**

1. An active peptide fraction containing immunopentatiating thymic polypeptides, prepared from freshly frozen thymic tissue by a process comprising:

(a) homogenenizing the frozen tissue in an aqueous cold solution containing an effective amount of a guanidinium salt, and

(b) isolating from the resulting homogenate the peptide material therein by an isolation method comprising ultrafiltration through ultrafilters having a molecular weight cut-off of 10,000 daltons and adsorption on and elution from a reverse phase hydrophobic resin with a miscible solvent capable of eluting and providing thereby the active peptide fraction.

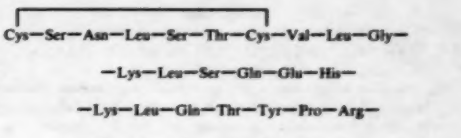
4,388,235

SYNTHESIS OF PEPTIDES

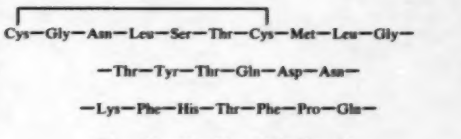
Ronald C. Orlowski, Frankfort, and Jay K. Seyler, Bourbonnais, both of Ill., assignors to Armour Pharmaceutical Company, Tarrytown, N.Y.

Filed Feb. 12, 1982, Ser. No. 348,397
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 T **6 Claims**

1. A peptide of the structure:



3. A peptide of the structure:



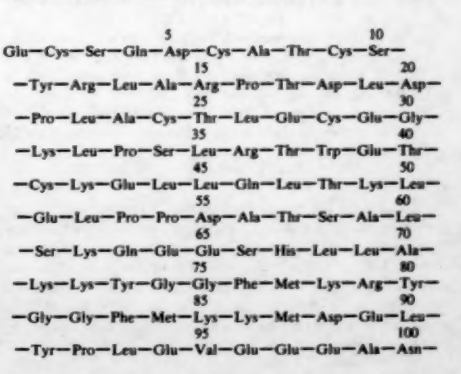
4,388,236

ENKEPHALIN-LIKE COMPOUNDS IN BOVINE ADRENAL MEDULLA

Stanley Stein, Bloomfield, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 253,984, Apr. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 157,137, Jun. 6, 1980, which is a division of Ser. No. 70,960, Aug. 29, 1979. This application May 4, 1982, Ser. No. 374,825
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R **7 Claims**

1. A peptide compound endogenous in mammalian adrenal glands, essentially free of other endogenous peptides and having the following amino acid sequence:



-continued

105 110
—Gly—Gly—Glu—Val—Leu—Gly—Lys—Arg—Tyr—Gly—

—Gly—Phe—Met

and the pharmaceutically acceptable acid addition salts or base salts thereof.

4,388,237

6(1-PIPERAZINYL), PIPERIDINO AND (1(HOMOPIPERAZINYL)11-CYANOMETHYLENE MORPHANTHRIDINES

Gerd Steiner, Kirchheim; Albrecht Franke, Wachenheim; Dieter Lenke; Hans-Juegen Teschendorf, both of Ludwigshafen; Wolfgang Worstmann, Gruenstadt, and Horst Kreiskott, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

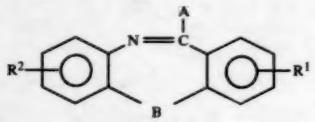
Filed May 7, 1980, Ser. No. 147,538

Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918778

Int. Cl.³ C07D *403/04, 403/06, 401/04*

U.S. Cl. 260—239 BC 16 Claims

1. A compound of the formula I



I

where R^1 and R^2 are hydrogen, fluorine, chlorine, methyl or trifluoromethyl and A is 4-methyl-piperazin-1-yl, 4-ethyl-piperazin-1-yl, 4-methyl-4-oxy-piperazin-1-yl, N'-methyl-homopiperazin-1-yl or 2-piperidin-1-yl-ethyl-amino and where B is an alkylene group of the formula

where X is hydrogen, and Y is cyano.

15. cis,trans-11-Cyanomethylene-6-(N'-methyl-homopiperazin-1-yl)-morphanthridine.

4,388,238

PROCESS FOR THE PREPARATION OF N,O-DISUBSTITUTED URETHANES SUITABLE AS A STARTING MATERIAL FOR THE PREPARATION OF ISOCYANATES

Peter Heitkämper, Dormagen; Klaus König, Leverkusen; Rudolf Fauss, Cologne, and Kurt Findeisen, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 15, 1980, Ser. No. 197,042

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943480

Int. Cl.³ C07C *125/065, 125/073, 125/077*

U.S. Cl. 260—239 E 6 Claims

1. A process for the preparation of N,O-disubstituted urethanes by reacting primary amines and alcohols with organic compounds having carbonyl groups in the temperature range of from 120° to 350° C., characterized in that N-unsubstituted urethanes and at least one compound taken from the group consisting of N-monosubstituted ureas, N,N'-disubstituted ureas and polyureas are used as the organic compounds having carbonyl groups.

4,388,239

PRODUCTION OF 1-HALOPHENYL AND 1-PHENYL-3,4-DIHYDRO-5H-2-BENZAZEPINE-5-ONES

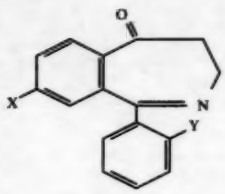
Eugene J. Trybulski, Parsippany, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 150,509, May 16, 1980, Pat. No. 4,318,854, which is a continuation-in-part of Ser. No. 10,118, Feb. 7, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 324,201

Int. Cl.³ C07D *223/16*

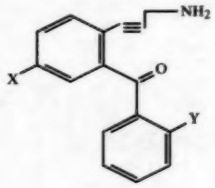
U.S. Cl. 260—239 BB 1 Claim

1. A process to produce a compound of the formula



wherein X and Y are selected from the group consisting of hydrogen, halogen and trifluoromethyl,

which consists essentially of the reaction of a compound of the formula



wherein X and Y are as above

with (A) a mixture of mercuric sulfate and a C_1 to C_4 carboxylic acid in an inert solvent at from about −10° C. to room temperature, or

(B) concentrated sulfuric acid at from about −10° C. to room temperature.

4,388,240

6-CHLORO-7,8-DIHYDROXY-1-(p-HYDROXYPHENYL)-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE SULFATE ESTERS

Richard H. Dewey, Philadelphia; Bruce Y. Hwang, Broomall, both of Pa., and George Y. Kuo, Cherry Hill, N.J., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Jan. 6, 1982, Ser. No. 337,227

Int. Cl.³ A61K *31/55;* C07D *223/16*

U.S. Cl. 260—239 BB 3 Claims

1. 6-Chloro-7,8-dihydroxy-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepin-4'-yl-hydrogen sulfate.

2. 6-Chloro-7-hydroxy-1-(p-hydroxyphenyl)-2,3,4,5-tetrahydro-1H-3-benzazepin-8-yl-hydrogen sulfate being substantially free from its 7-isomer.

3. 6-Chloro-8-hydroxy-1-(p-hydroxyphenyl)-2,3,4,5-tetrahydro-1H-3-benzazepin-7-yl-hydrogen sulfate being substantially free from its 8-isomer.

4,388,241
BILE ACIDS

Reginald Monks, Amersham, England, assignor to The Radiochemical Centre Limited, Buckinghamshire, England

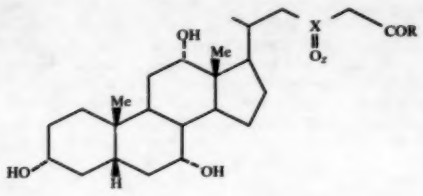
Continuation of Ser. No. 54,574, Jul. 3, 1979, abandoned. This application Jan. 14, 1981, Ser. No. 224,922

Claims priority, application United Kingdom, Jul. 3, 1978, 28569/78

Int. Cl.³ C07J 9/00

U.S. Cl. 260—397.1 8 Claims

1. A compound having the formula



where

X is Se or Te,

zi s 0 or 1, and

R is OH or a radical derived by removal of a hydrogen atom from the amino group of an amino acid.

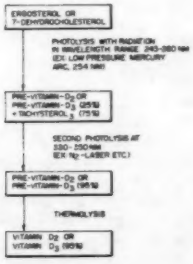
4,388,242
METHOD OF PRODUCTION OF VITAMIN-D

Vincenzo Malatesta; Clive Willis, and Peter A. Hackett, all of Ottawa, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Mar. 15, 1982, Ser. No. 358,201

Int. Cl.³ C07J 17/00, 9/00

U.S. Cl. 260—397.2 2 Claims



1. A method of production of vitamin-D_2 or vitamin-D_3 using ergosterol or 7-dehydro-cholesterol or their dihydroxy derivatives as the starting materials comprising:

(a) irradiating the starting material with light in the wavelength range 245–260 nanometers to obtain a product containing pre-vitamin-D_2 or pre-vitamin-D_3 as a minor proportion and tachysterol$_2$ and tachysterol$_3$ as a major proportion

(b) irradiating this product with light in the wavelength range 330–360 nanometers to obtain a product containing approximately 95% pre-vitamin-D_2 or pre-vitamin-D_3, and

(c) heating this product to convert the pre-vitamin-D_2 or pre-vitamin-D_3 to vitamin D_2 or vitamin D_3.

4,388,243
PROCESS FOR THE PREPARATION OF ACTIVE-TYPE VITAMIN D_3 COMPOUNDS

Osamu Nishikawa; Kenji Ishimaru, both of Iwakuni; Toru Takeshita, Hino, and Hideki Tsuruta, Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

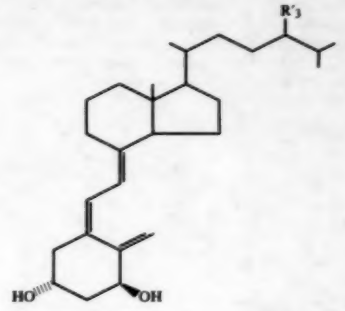
Continuation of Ser. No. 199,126, Oct. 22, 1980. This application Apr. 26, 1982, Ser. No. 371,870

Claims priority, application Japan, Oct. 23, 1979, 54-135871; Dec. 27, 1979, 54-169464; Dec. 27, 1979, 54-169465; Apr. 18, 1980, 55-50258

Int. Cl.³ C07J 9/00

U.S. Cl. 260—397.2 14 Claims

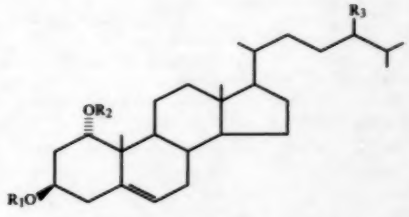
3. A process for preparing an active-type vitamin D_3 compound of the following formula [IV]



[IV]

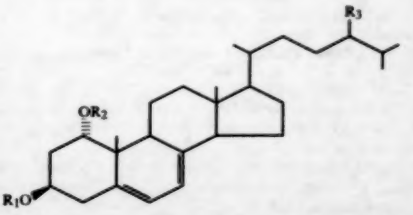
where R_3' represent a hydrogen atom or a hydroxyl group, which consists essentially of:

(i) reacting a hydroxycholesta-5-ene of the following formula [I]



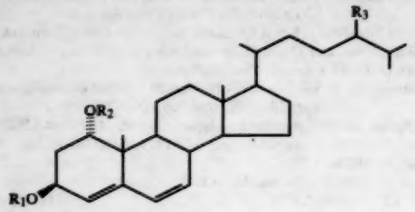
[I]

wherein R_1 and R_2 represent a lower alkoxycarbonyl group, R_3 represents a hydrogen atom or a lower alkoxycarbonyloxy group, with an allylic brominating agent in an inert organic solvent, and then contacting the resulting reaction mixture with a dehydrobrominating agent to form a mixture of a hydroxycholesta-5,7-diene of the following formula [II]



[II]

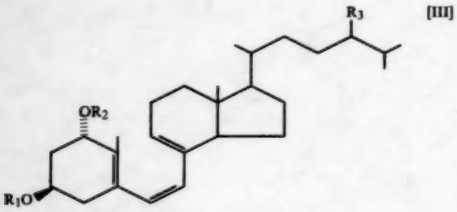
wherein R_1, R_2 and R_3 are the same as defined above and a hydroxycholesta-4,6-diene of the following formula



wherein R_1, R_2 and R_3 are the same as defined above;

(ii) separating the mixture by means of recrystallization to obtain the pure hydroxycholesta-5,7-diene;

(iii) exposing the hydroxycholesta-5,7-diene of formula [II] to ultraviolet irradiation in an inert organic solvent to obtain a mixture of previtamin D_3 compound of the following formula [III]



[III]

wherein R_1, R_2 and R_3 are the same as defined above, and the unchanged hydroxycholesta-5,7-diene;

(iv) separating the mixture by means of recrystallization or rinse into the previtamin D_3 compound, and the unchanged hydroxycholesta-5,7-diene;

(v) recycling the unchanged hydroxycholesta-5,7-diene through the ultraviolet irradiation; and

(vi) thermally isomerizing the previtamin D_3 compound and splitting off the protective groups.

4. The process of claim 3, wherein R_1 and R_2 in the hydroxycholest-5-ene of formula [1] are an ethoxycarbonyl or a methoxycarbonyl group.

4,388,244

PETROLATUM OR HYDROCARBON WAX OXIDATE COMPOSITION

Donald D. Carlos, Louisville, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 9, 1981, Ser. No. 271,906

Int. Cl.³ C09F 7/00

U.S. Cl. 260—404.5 **39 Claims**

1. A petrolatum or hydrocarbon wax oxidate composition having a sinewy or film-forming characteristic comprising the reaction product of:

(a) a hydrocarbon wax oxidate, a petrolatum oxidate or a mixture of said hydrocarbon wax oxidate and said petrolatum oxidate, with

(b) a polyamine containing at least two amino groups, each group having at least one active hydrogen atom; or the metal salt of said reaction product.

4,388,245

PROCESS FOR PREPARING ORGANIC POLYISOCYANATE COMPOSITIONS

Kaoru Ueyanagi; Akira Ide, both of Nobeoka; Masaaki Kato, Fuji, and Kazuro Komatsu, Hyuga, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Aug. 17, 1981, Ser. No. 293,174

Claims priority, application Japan, Aug. 28, 1980, 55-117803

Int. Cl.³ C07C 127/24, 119/042

U.S. Cl. 260—453 AB **26 Claims**

1. A process for preparing an aliphatic, alicyclic or araliphatic organic polyisocyanate composition which comprises heating an aliphatic, alicyclic or araliphatic organic polyisocyanate composition having at least two isocyanate groups in one molecule at a temperature of from about 100° C. to about 200° C. in the presence of an aliphatic, alicyclic or araliphatic organic diisocyanate monomer in an amount of at least about ½ of the weight of the organic polyisocyanate composition and removing unreacted aliphatic, alicyclic or araliphatic organic diisocyanate monomer.

4,388,246

PROCESS FOR THE PREPARATION OF POLYISOCYANATES

Rudolf Sundermann; Klaus König, both of Leverkusen; Theodor Engbert, Dormagen; Gernot Becker, Dormagen, and Günther Hammen, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 4, 1982, Ser. No. 354,687

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 3108990

Int. Cl.³ C07C 118/00

U.S. Cl. 260—453 P **7 Claims**

1. A process for the production of a polyisocyanate from a carbamate corresponding to the formula:

$$R^1(NH—CO—O—R^2)_n$$

wherein

R^1 represents an aliphatic hydrocarbon radical which may have inert substituents and/or be olefinically unsaturated with a total of from 2 to 18 carbon atoms; a cycloaliphatic hydrocarbon radical which may contain inert substituents and/or be olefinically unsaturated with a total of from 3 to 18 carbon atoms; an araliphatic hydrocarbon radical which may contain inert substituents with a total of from 7 to 18 carbon atoms; or an aromatic hydrocarbon radical which may have inert substituents with a total of from 6 to 27 carbon atoms;

R^2 represents a radical of the type obtained by removing the hydroxyl group from a primary or secondary aliphatic, cycloaliphatic or araliphatic alcohol having a boiling point which is at least 10° C. higher or lower than the boiling point of the polyisocyanate; and

n represents an integer greater than or equal to 2

comprising:

(a) thermally splitting the carbamate at a temperature of from 150° to 350° C. and pressure of from 0.001 to 20 bar in the presence of an auxiliary compound selected from the group consisting of hydrogen chloride, organic acid chlorides, compounds having an alkylating effect, organotin (IV) chlorides and mixtures thereof; and if necessary,

(b) separating the thus-formed polyisocyanate and alcohol.

4,388,247

TRIHALOMETHYLATION OF ALDEHYDES

Petrus A. Kramer, Amsterdam, Netherlands, and Pieter A. Verbrugge, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

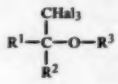
Division of Ser. No. 133,773, Mar. 25, 1980, Pat. No. 4,285,882. This application Aug. 25, 1980, Ser. No. 180,773

Claims priority, application United Kingdom, Mar. 27, 1979, 7910661

Int. Cl.³ C07C *68/00*

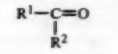
U.S. Cl. 260—463 **14 Claims**

1. A process for the preparation of a compound of the formula I



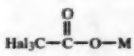
I

wherein R^1 represents a 2-(2,2-dimethoxyethyl)-3,3-dimethylcyclopropyl group, a 2-hydroxycarbonyl-3,3-dimethylcyclopropyl group, a [2,2-dimethyl-3-(2-oxopropyl)cyclopropyl]-methyl group or a 2-alkoxycarbonyl-3,3-dimethylcyclopropyl group in which the alkoxy substituent has fewer than five carbon atoms; R^2 represents a hydrogen atom; each Hal represents a chlorine or bromine atom; and R^3 represents (i) a group —C(O)OM in which M represents an alkali metal atom or (ii) a group —C(O)OR⁴ in which R^4 represents an alkyl group with fewer than five carbon atoms, which process comprises reacting a carbonyl compound of the formula:



(II)

wherein R^1 and R^2 have the same meanings as in formula I, with a trihaloacetate of the formula:



(III)

wherein Hal and M have the above-mentioned meaning, in the presence of a highly polar, aprotic, inert solvent, thus forming a compound of formula I, in which R^3 represents the group —C(O)OM and, if desired, converting this compound of formula I by treatment with an alkylating agent into a compound of formula I, in which R^3 represents the group mentioned in (ii) hereinbefore.

4,388,248

AMMOXIDATION PROCESSES

Kenneth V. Wise, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 973,429, Dec. 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 866,596, Jan. 3, 1978, Pat. No. 4,162,992. This application Oct. 20, 1981, Ser. No. 313,140

The portion of the term of this patent subsequent to Jul. 31, 1996, has been disclaimed.

Int. Cl.³ C07C *120/14*

U.S. Cl. 260—465.3 **10 Claims**

1. A process for the production of acrylonitrile which comprises reacting at an elevated temperature in the vapor phase propylene, ammonia, and molecular oxygen over a catalyst having catalytic components consisting essentially of compounds of antimony, vanadium, titanium and oxygen, said catalytic components having the empirical formula

$$Sb_aV_bTi_cO_x$$

wherein a is at least 6, b is 1, and c is a number such that the ratio of c/a is from 0.75 to 3, and x is a number taken to satisfy the valence requirements of the metal ions present.

4,388,249

3-(ALKOXYPHENYLSULFONYL)ACRYLONITRILES

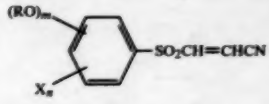
Arnold D. Gutman, Berkeley, and John W. Williams, Vallejo, both of Calif., assignors to Stauffer Chemical Company, Richmond, Calif.

Continuation of Ser. No. 221,119, Dec. 29, 1980, Pat. No. 4,331,480. This application Feb. 26, 1982, Ser. No. 352,679

Int. Cl.³ C07C *121/75*

U.S. Cl. 260—465 F **2 Claims**

1. A compound having the formula



in which R is lower alkyl; X is halogen or lower alkyl; m is 1 or 2; and n is 1, 2, or 3.

4,388,250

PROCESS FOR THE PREPARATION OF P-HYDROXY-BENZYL-NITRILES AND CORRESPONDING AMINES

Leon Farber, Somerset, and Peter S. Gradeff, Pottersville, both of N.J., assignors to Rhone Poulenc Inc., Monmouth Junction, N.J.

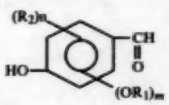
Filed Mar. 15, 1982, Ser. No. 358,397

Int. Cl.³ C07C *121/75, 87/28*

U.S. Cl. 260—465 F **19 Claims**

1. A process for preparing p-hydroxy-benzyl nitriles which comprises, in sequence:

(a) reducing a benzaldehyde having the formula:



wherein:

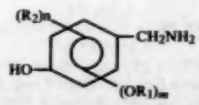
R_1 is methyl or ethyl;

R_2 is methyl or ethyl;

m is a number from 0 to 4;

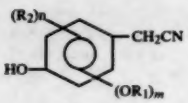
n is a number from 0 to 4;

with hydrogen gas at a pressure within the range from atmospheric pressure up to about 150 psi at a temperature within the range from about 20° to about 100° C. in an aqueous reaction medium comprising ammonia in an amount within the range from a stoichiometric amount up to about ten times the stoichiometric amount and Raney nickel catalyst, thereby forming the corresponding benzyl amine:



(b) replacing the amino group of the benzylamine with a nitrile group by reaction with a cyanide selected from the group consisting of alkali metal cyanides and hydrogen cyanide in solution in a solvent selected from the group consisting of dimethyl formamide, dimethyl sulfoxide and dimethyl pyrrolidone at a temperature within the range from about 80° C. up to the reflux temperature of the

solution, thereby forming the corresponding benzyl nitrile:

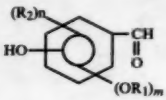


and

(c) removing the solvent and recovering the benzyl cyanide.

11. A process for preparing primary hydroxy-benzyl amines which comprises

(a) reducing a benzaldehyde having the formula:



wherein:

HO is in the ortho, meta or para position;

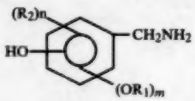
R_1 is methyl or ethyl;

R_2 is methyl or ethyl;

m is a number from 0 to 4;

n is a number from 0 to 4;

with hydrogen gas at a pressure within the range from atmospheric pressure up to about 150 psi at a temperature within the range from about 20° to about 100° C. in an aqueous reaction medium comprising ammonia in an amount within the range from a stoichiometric amount up to about ten times the stoichiometric amount and Raney nickel catalyst, thereby forming the corresponding hydroxy-benzylamine:



and

(b) recovering the hydroxy-benzylamine.

4,388,251

METHOD FOR PREPARING 2-CHLOROBENZOYL CHLORIDE

David P. Clifford, King's Lynn, England, assignor to The Dow Chemical Company Limited, King's Lynn, England

Continuation of Ser. No. 202,914, Nov. 3, 1980, abandoned. This application Jan. 28, 1982, Ser. No. 343,645

Int. Cl.³ C07C *51/58*

U.S. Cl. 260—544 D **3 Claims**

1. A process for preparing 2-chlorobenzoyl chloride which comprises reacting 2-chlorobenzaldehyde with chlorine in the presence of phosphorus pentachloride at a temperature of from 50° to 200° C. and wherein the 2-chlorobenzaldehyde:phosphorus pentachloride ratio is from 1:0.05 to 1:0.2.

4,388,252

PROCESS FOR THE MANUFACTURE OF VINYL PHOSPHONIC ACID DERIVATIVES

Walter Dürsch, Königstein, and Hans-Jerg Kleiner, Kronberg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

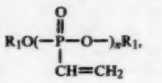
Filed Jan. 12, 1981, Ser. No. 224,316

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1980, 3001894

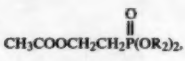
Int. Cl.³ C07F *9/388, 9/40*

U.S. Cl. 260—968 **4 Claims**

1. A process for the manufacture of a vinyl phosphonic acid derivative of the formula



wherein R_1 is hydrogen of alkyl having 1 to 4 carbon atoms and n is 1 or 2, said process comprising heating to 150°–270° C. a 2-acetoxyethane phosphonic acid dialkyl ester of the formula



wherein R_2 is alkyl having 1 to 4 carbon atoms in the presence of a catalytic amount of an acidic or basic catalyst.

4,388,253

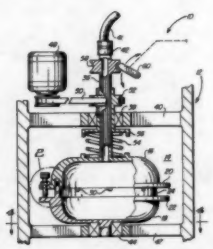
LIQUID COLLECTING AND DISPENSING APPARATUS

Thomas J. Maxwell, 14817 N. 50th Pl., Scottsdale, Ariz. 85254

Filed Dec. 10, 1981, Ser. No. 329,285

Int. Cl.³ F02M *17/16*

U.S. Cl. 261—88 **7 Claims**



1. A liquid collecting and dispensing apparatus, comprising:

means for collecting the liquid including first and second halves, said second half being adjustably disposed within a portion of said first half to form a hollow chamber and valve collar therebetween;

means for inputting the liquid into said chamber comprising hollow shaft means;

a plurality of apertures formed in said valve collar the effective openings of which are varied by adjusting said first and second halves with respect to one another, said plurality of apertures for metering the discharge of the liquid from said chambers;

an electric motor;

pulley drive means coupling said electric motor to said hollow shaft means for rotating said first and second halves; and

means for selectively moving said first and second halves with respect to one another to vary the amount of liquid that is dispensed from the apparatus, said means for selectively moving including a collar coupled with said hollow

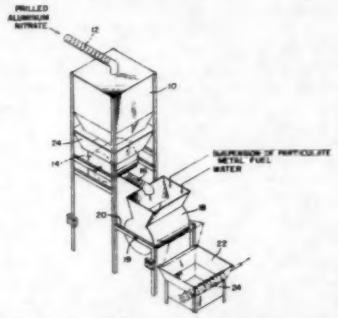
shaft; a flanged member coupled with said hollow shaft; a spring connected between said flanged member and said first half; and linkage means coupled with said collar for raising and lowering said hollow shaft, said hollow shaft being slidably mounted within a main assembly structure to which said second half section is fixedly mounted.

4,388,254

SYSTEM FOR MAKING A HOMOGENEOUS AQUEOUS SLURRY-TYPE BLASTING COMPOSITION

Michel E. Maes, Bellevue, Wash.; Robert L. Shaw, Dallas, Tex., and Royal L. Reinsch, Redmond, Wash., assignors to Energy Sciences Partners, Ltd., Seattle, Wash.

Filed May 29, 1980, Ser. No. 154,381
Int. Cl.³ C06B 21/00
U.S. Cl. 264—3 C 8 Claims



1. A method for making a homogeneous, aqueous slurry-type blasting composition containing a particulate inorganic nitrate oxidizer and a finely divided metal fuel, comprising:

premixing the finely divided metal fuel with water and a gelling agent to form a stable suspension of the finely divided metal fuel in the water;

mixing the aqueous suspension of finely divided metal fuel with the particulate nitrate oxidizer and an additional amount of water; and

slowly tumbling the mixture for a brief time sufficient to uniformly mix the components.

4,388,255

METHOD FOR PRODUCING PRE-SHAPED α-SILICON NITRIDE WHISKER COMPACTS AND LOOSE WHISKERS FOR COMPOSITE MATERIAL REINFORCEMENT

Frederick H. Simpson, Seattle, Wash., assignor to Boeing Aerospace Co. (A Division of the Boeing Company), Seattle, Wash.

Filed Mar. 27, 1981, Ser. No. 248,498
Int. Cl.³ C01B 21/06
U.S. Cl. 264—29.1 39 Claims

1. A method for producing a pre-shaped compact of α-silicon nitride whiskers comprising the steps of:

(a) blending silicon particles with fugitive composition particles able to sublime without leaving a residue;

(b) compacting the blend to a desired shape;

(c) subliming and fugitive composition particles from said compacted shape to form a porous silicon precursor compact having said desired shape;

(d) reacting said shaped silicon compact with a substance that releases free nitrogen, said reaction occurring at a temperature sufficiently high to convert said shaped silicon compact to an identically shaped porous compact of

α-silicon nitride whiskers but sufficiently low to avoid subliming substantially all of said formed whiskers.

4,388,256

PROCESS FOR MANUFACTURING REGENERATED CELLULOSE HOLLOW FIBER

Masamichi Ishida, 2-19, Nishisakae, Otake-shi, Hiroshima-ken; Jun Kamo, 3-2-1, Kurokawa, Otake-shi, Hiroshima-ken; Toru Takemura, 3-2-303, Kurokawa 3-chome; Shunsuke Minami, 3-2-104, Kurokawa 3-chome, both of Otake-shi, Hiroshima-ken, and Kensuke Kamada, 44-20, Hanazono-cho, Chiba-shi, Chiba-ken, all of Japan

Filed Aug. 28, 1979, Ser. No. 70,651
Claims priority, application Japan, Nov. 24, 1978, 53/145185; Dec. 14, 1978, 53/157000
Int. Cl.³ B29D 27/00
U.S. Cl. 264—41 12 Claims

1. A process for producing a membrane substantially consisting of cellulose in the form of a hollow fiber, which comprises the step of:

extruding a dope comprised of cellulose ester in a nonvolatile organic solvent having a boiling point of at least 100° C. through a circular slit defined between inner and outer tubes of a spinning nozzle having a double tube structure, while a core liquid substantially insoluble in water is forced through the inner tube of said nozzle;

coagulating the hollow fibrous extrudate in a coagulating bath;

drawing the coagulated hollow fibrous extrudate 1.05 to 2.00 times its original length; and then,

treating the drawn hollow fiber still containing the core liquid in the hollow, with an aqueous caustic alkali solution containing at least 0.5% by weight of a water-soluble metal salt, thereby hydrolyzing the cellulose ester into cellulose.

4,388,257

PROCESS FOR PREPARING CALCIUM SILICATE SHAPED PRODUCT

Yasuo Oguri, Tokyo; Mitsuru Awata, Kodaira, and Mitsunobu Abe, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Jan. 23, 1981, Ser. No. 227,696
Claims priority, application Japan, Feb. 4, 1980, 55-12162
Int. Cl.³ B28B 1/26
U.S. Cl. 264—82 9 Claims

1. A process for preparing a shaped calcium silicate product, comprising:

(a) forming an aqueous slurry of calcium silicate hydrate by heating and reacting a calcareous source with a siliceous source in water;

(b) admixing therewith reinforcing fibers molding resultant mixture into a shaped object having a bulk density of less than 0.6 g/cm^3;

(c) curing said molded product in a closed tank having a capacity of 1.5 to 30 times the volume of said molded product at 140° to 300° C. by steam, the total amount of steam in said closed tank being generated from the water in said molded product; and

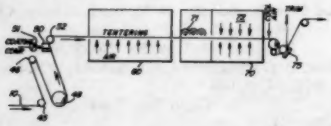
(d) drying said cured product.

4,388,258

POLYMER FILM COATED WITH AQUEOUS POLYMER

Gordon P. Hungerford, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 19, 1981, Ser. No. 235,887
Int. Cl.³ B29D 7/24
U.S. Cl. 264—129 8 Claims



1. A method for producing biaxially-oriented acrylonitrile polymer film comprising the sequential steps of

forming a continuous aquagel film having a self-supporting acrylonitrile polymeric matrix with water uniformly dispersed therein;

heating and stretching said aquagel film longitudinally to orient the polymer uniaxially;

applying an aqueous coating of vinylidene chloride polymer to at least one surface of said aquagel film;

transversely stretching the coated aquagel film to provide biaxially-oriented polymer; and

drying the coated, oriented polymer film under constraint to remove water from the coating and film concurrently.

4,388,259

FLUOROCARBON POLYMER GASKET AND METHOD OF MANUFACTURING SUCH

Walter E. B. Jewell, Glenside, and Adam J. Patarcity, Levittown, both of Pa., assignors to Kennecott Corporation, Stamford, Conn.

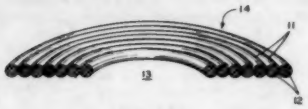
Filed Oct. 23, 1981, Ser. No. 314,186
Int. Cl.³ B29C 3/00
U.S. Cl. 264—153 14 Claims

1. A method of manufacturing fluorocarbon polymer gaskets which comprises:

(a) heating a fluorocarbon polymer sheet of predetermined thickness to within the temperature range at which the fluoro-carbon polymer enters the gel state;

(b) compressing said heated sheet to a thickness less than said sheet's predetermined thickness;

(c) cooling said sheet in its compressed state; and



(d) cutting said sheet, cooled in its compressed state, into a gasket.

4,388,260

METHOD OF MAKING VISCOSE RAYON

Gregory C. Bockno, Media, Pa., assignor to Avtex Fibers Inc.

Division of Ser. No. 21,150, Mar. 16, 1979, Pat. No. 4,245,000, which is a continuation-in-part of Ser. No. 793,572, May 4, 1977, abandoned. This application Jan. 8, 1981, Ser. No. 223,465
Int. Cl.³ D01D 5/22
U.S. Cl. 264—168 7 Claims

1. The method of producing crimped regenerated cellulose filaments with an unsymmetrical, multilobular, skin-core cross-section wherein the core is surrounded by a discontinuous broken skin, which comprises

(a) preparing a modifier-free viscose containing from about 6% to 10% cellulose, from about 4% to 9% caustic soda, and from 28% to 45% carbon disulfide based upon the weight of cellulose;

(b) ripening the viscose to a sodium chloride salt index of 5.5 to 15 and a spinning ball fall viscosity of 60 to 110 seconds;

(c) extruding the ripened viscose into an aqueous spinning bath containing from about 4% to 8% sulfuric acid, from about 0.5% to 3% zinc sulfate and from about 17% to 22% sodium sulfate maintained at a temperature between 40 and 65 degrees centigrade;

(d) withdrawing the filaments from the spinning bath, passing the filaments through an aqueous stretch bath maintained at a temperature between 85° C. and 95° C.;

(e) controlling residence time in the spin bath so as to allow stretching the filaments in the stretch bath from about 65% to 120%, said filaments having a wet modulus of between about 5 and 12;

(f) cutting the stretched filaments into staple length fibers; and

(g) relaxing the cut fibers in water having a temperature between about 75° and 100° C.

4,388,261

METHOD FOR FORMING A COMPARTMENTED PUNCTURE SEALANT PACKAGE BY CO-EXTRUSION

Thomas E. Codispoti, Akron; James M. Giustino, Uniontown; Richard M. Griffith, Akron, all of Ohio, and James T. Tsai, Fremont, Calif., assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Oct. 1, 1981, Ser. No. 307,401
Int. Cl.³ B29D 7/04; B29H 3/00
U.S. Cl. 264—171 7 Claims

1. A method of forming a compartmented package containing puncture sealant for use in a tire, the steps of the method comprising

(a) providing a first stream of uniform cross-section of a puncture sealant.

(b) providing a second stream of a package forming material;

(c) encapsulating the puncture sealant stream within the package forming material;

(d) forming continuous ribs of the package forming material through the puncture sealant surrounded by package forming material;

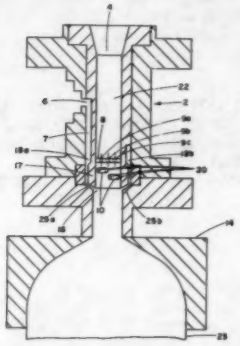
(e) supplying the compartmented stream of the puncture

sealant to an extrusion die defining an elongate slot like orifice; and

(f) forming and expanding the composite stream into a generally elongate configuration with ribs extending from package wall to package wall each rib forming a juncture angle of from 1° to 90° with a package wall.

7. An apparatus for forming a compartmented package comprising:

(a) a means for providing a first stream of uniform cross-section of a puncture sealant and a second stream of a package forming material.



(b) a means for encapsulating the puncture sealant stream within the package forming material;

(c) a means for forming non-parallel continuous ribs of the package forming material through the puncture sealant surrounded by package forming material;

(d) a means for supplying the compartmented stream of the puncture sealant to an extrusion die defining an elongate slot like orifice; and

(e) a means for forming and expanding the composite stream into a generally elongate configuration with ribs extending from package wall to package wall each rib forming a juncture angle of from 1° to 25° with a package wall.

4,388,262

METHOD FOR THE FORMING OF PLASTICS

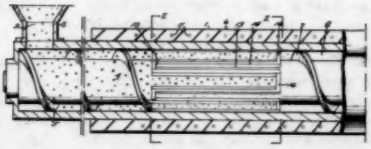
Albert J. H. Brasz, Born, Netherlands, and Hermanus A. Wallink, Selfkant, Fed. Rep. of Germany, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Feb. 20, 1981, Ser. No. 236,046

Claims priority, application Netherlands, Feb. 21, 1980, 8001053

Int. Cl.³ B29B *1/06, 3/02*

U.S. Cl. 264—176 R **31 Claims**



1. A method of forming thermoplastic and/or elastomeric materials utilizing a plastics processing machine of the type including a chamber having a predetermined diameter D, material supply means in communication with said chamber for supplying material to said chamber, means defining a material exit, and screw means operatively associated with said chamber for conveying said material from said material supply means to said exit means, said chamber defining a feed zone, a material heating zone downstream of said feed zone, and a homogenization zone downstream of said feed zone, wherein said screw means includes a melt torpedo disposed in said material heating zone having a plurality of alternating grooves and ridges thereby defining therebetween a plurality of alternating inlet and discharge channels for melting the material and discharging the melted material, respectively, said method comprising:

(a) supplying solid material to the chamber;

(b) melting the material in the material melting zone above its melting point to a predetermined peak temperature; and

(c) allowing the material melted according to step (b) to cool in the homogenization zone to a substantially lower final melt temperature below the peak temperature prior to exiting the chamber via said material exit means so that at least comparable amounts of material can be processed per unit time at a lower final melt temperature than conventionally associated with the material.

4,388,263

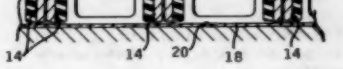
CONTROLLED ELASTOMERIC TOOLING FOR PLASTIC FABRICATION

John Prunty, San Diego, Calif., assignor to General Dynamics Corp./Convair Division, San Diego, Calif.

Filed Oct. 13, 1981, Ser. No. 311,102

Int. Cl.³ B29D *3/02*; B29C *1/12, 1/02*

U.S. Cl. 264—257 **9 Claims**



1. The method of applying pressure to a composite material through thermal expansion of an elastomeric pad which comprises the steps of:

arranging said material between mold surfaces, at least one of which comprises a movable reaction block;

positioning a pressure application means adjacent to said reaction block, said pressure application means comprising a container having a base and an upstanding edge extending toward said reaction block and an elastomeric pad spaced a selected distance from said base and retained by said edges; to provide a gap between said pad and the container base

adjusting said reaction block and pad so that said block is in aligned contact with said material and said pad is in contact with the opposite side of said reaction block, by rotating a loosely fitting threaded mounting means between said reaction block and a fixed support therefor and,

heating said assembly to the curing temperature of said material;

whereby said pad expands into said gap during initial heating without exerting significant pressure on said block, then when said gap is filled exerts selected pressure on said block as temperature is further increased.

4,388,264

METHOD AND MEANS FOR WINDING HELICAL COILS FROM THERMOPLASTIC MATERIALS

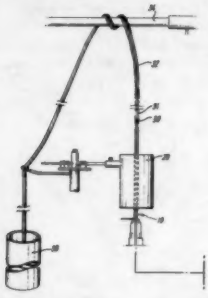
Gerrit W. E. Leuvelink, Haaksbergen, Netherlands, assignor to Textieltechniek Haaksbergen B.V., Haaksbergen, Netherlands

Filed Sep. 25, 1981, Ser. No. 305,704

Claims priority, application United Kingdom, Sep. 26, 1980, 8031199

Int. Cl.³ B29C *17/02*

U.S. Cl. 264—281 **17 Claims**



1. A method of producing a coil for use in the manufacture of a link belt comprising winding a strand of polymeric material onto a first section of a mandrel of a given cross-section to form a coil, heating the coil so formed whilst moving said coil longitudinally of said first section, passing said heated coil through a zone in which it is cooled and twisted, in its coiled form, in a twist direction so as to tend to reduce the cross-section of the so-twisted coil, whilst being supported by a second section of said mandrel having a reduced cross-section in comparison with said first section, and removing said coil from said mandrel overend thereof.

4,388,265

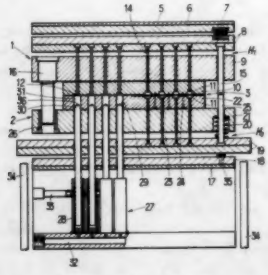
PROCESS AND APPARATUS FOR MOLDING PLASTICS

Kazuo Bandoh, No. 81-8, Toyama, Momoyama-cho, Fushimi-ku, Kyoto-shi, Japan

Filed Dec. 14, 1981, Ser. No. 330,699

Int. Cl.³ B29G *3/00*

U.S. Cl. 264—297.2 **5 Claims**



1. In a process of molding a number of articles of plastics at the same time with use of molds having a multiplicity of cavities, the improvement which comprises supplying the plastics molding material to a plurality of pots individually, the pots being arranged in proximity to the cavities, and injecting the molding material into the cavities from the pots through gates without passing the material through runners.

2. In molding apparatus for forming plastics molded articles including an upper mold and a lower mold which can be clamped and opened and having a multiplicity of cavities in the fitting surfaces thereof, and means for injecting a plastics molding material from a pot into the cavities, the improvement which comprises a plurality of pots formed in the fitting surface of one of the upper and lower molds and positioned in proximity to the cavities, molding material injecting means provided on the same mold as the pots in corresponding relation to the pots individually, cull portions formed in the fitting surface of the other mold and opposed to the pots individually, and gates for holding each of the pots in communication with the corresponding cavities without any runner provided between the pot and the cavities.

4,388,266

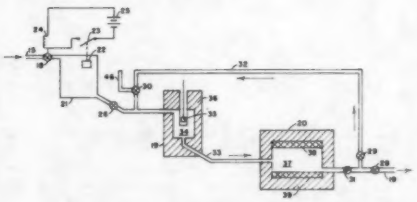
METHOD AND SYSTEM FOR MONITORING ORE GRADE OF AN URANIUM BEARING MIXTURE

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 17, 1980, Ser. No. 187,926

Int. Cl.³ G01N *23/12*

U.S. Cl. 376—164 **2 Claims**



1. A method of monitoring the ore grade of an uranium bearing fluid mixture comprising the steps of:

(a) transporting an uranium bearing fluid mixture past a source of neutrons so as to permit continuous irradiation of said fluid mixture with fast neutrons,

(b) transporting said irradiated fluid mixture past a single neutron counter, and

(c) recycling said uranium bearing fluid mixture past said neutron source and said single neutron counter to affect a build-up of delayed fission neutrons such that the predominate delayed fission neutron groups of uranium-235 appear as a single neutron group to said single neutron counter with an effective half-life at about 13.9 seconds.

4,388,267

TEMPERATURE PROFILE DETECTOR

Richard D. Tokarz, West Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 29, 1981, Ser. No. 229,496

Int. Cl.³ G01K *11/06*; G21C *17/00*

U.S. Cl. 376—247 **5 Claims**

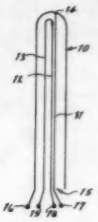
1. A temperature profile detector comprising:

a tubular sheath having a first closed end and a second end, said sheath surrounding a single loop of electrically conductive wire including an active leg and a return leg each leading to the second end of the sheath, said active leg serving as a first elongated electrical conductor;

said sheath further surrounding a single length of electrically conductive wire connected to its closed end and serving as a second electrical elongated conductor parallel to said first conductor and spaced from it by the minimum distance required to normally maintain an open circuit between them;

said first electrical conductor being made of material having a preselected melting point and said second electrical

conductor being made of material whose melting point is appreciably above said preselected melting point;
and confining insulating means surrounding said first and second electrical conductors for allowing molten metal



from the first conductor to bridge the separation between the first and second electrical conductors after the attainment of a temperature equal to the melting point of the first electrical conductor at a location along its length.

4,388,268

TRANSPORTATION AND/OR STORAGE CONTAINERS FOR RADIOACTIVE MATERIALS

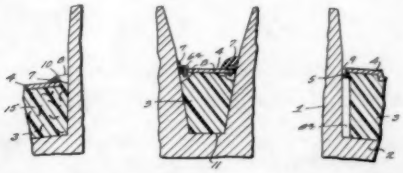
Hans-Günther Knackstedt, Langenselbold; Erhard Müller, Grundau; Richard Christ, Bruchköbel, and Hartmut Kroll, Hanau, all of Fed. Rep. of Germany, assignors to Transnuklear GmbH, Hanau, Fed. Rep. of Germany

Filed Nov. 17, 1980, Ser. No. 207,359

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 7932527[U]

Int. Cl.³ G21C *19/00*

U.S. Cl. 376—272 **7 Claims**



1. A container suitable for conveyance and/or storage of radioactive materials which produce gamma and neutron radiation and significant residual heat, comprising, in combination, a container body having shielding means for gamma radiation, neutron shielding means and bar-shaped cooling fins, said container having an exterior surface, said cooling fins extending outwardly from said exterior surface and having spaces each therebetween, each said cooling fin having a pair of opposite side surfaces on each of which are disposed a boss means intermediate the ends of each said cooling fin, said neutron shielding means including a plurality of segments with a said segment disposed in the space between adjacent ones of said cooling fins, cover means overlying each of said segments, said boss means of each said cooling fin contacting a portion of a respective said cover means to hold said cover means in place on said respective segment of neutron shielding means.

4,388,269

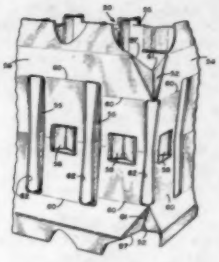
SPACER GRID CORNER GUSSET

Jeffrey G. Larson, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 21, 1980, Ser. No. 209,087

Int. Cl.³ G21C *3/34*

U.S. Cl. 376—442 **5 Claims**



1. A spacer grid for a bundle of longitudinally extending rods in spaced generally parallel relationship comprising;
spacing means for holding the rods in spaced generally parallel relationship, said spacing means including at least one exterior grid strip circumscribing the bundle of rods along the periphery thereof;
said at least one exterior grid having a first end defining the boundary of said strip in one longitudinal direction and a second end defining the boundary of said strip in the other longitudinal direction,
said at least one exterior grid strip having at least one bend formed therein parallel to the longitudinal direction, and
a plurality of sloped corner gussets formed by said at least one bend and said first end and said second end.

4,388,270

RHENIUM-BEARING COPPER-NICKEL-TIN ALLOYS

Michael F. Stavish, Trumbull, and Aldo M. Reti, Milford, both of Conn., assignors to Handy & Harman, New York, N.Y.

Filed Sep. 16, 1982, Ser. No. 418,604

Int. Cl.³ C22C *9/02*; C22F *1/08*

U.S. Cl. 420—473 **33 Claims**

1. A copper based alloy consisting essentially of about 4–15 percent nickel, about 4–8 percent tin, the balance essentially copper, to which was added about 0.002–0.4 percent of rhenium.

4,388,271

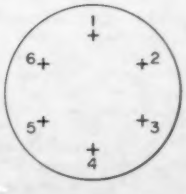
RAPID DIAGNOSTIC AGENTS

Dieter Kraemer, Mainz; Klaus Lehmann, Rossdorf, and Roland Hartl, Muenster, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 110,905, Jan. 10, 1980, abandoned. This application Sep. 10, 1981, Ser. No. 300,899

Int. Cl.³ G01N *33/72*

U.S. Cl. 422—56 **5 Claims**



1. A diagnostic agent for the rapid detection of blood in

excretions and body fluids, which diagnostic agent consists essentially of a filter paper support simultaneously impregnated with

(1) a chromogenic indicator selected from the group consisting of guaiac and chromogenic phenylamino compounds and capable of color change in the simultaneous presence of peroxidase-active hemoglobin present in blood and of peroxide solution separately applied to said diagnostic agent for development thereof, and

(2) a resin selected from the group consisting of acrylic resins, methacrylic resins, and combinations thereof, said chromogenic indicator and resin being distributed uniformly or homogeneously throughout said filter paper, and said resin being present in an amount effective to reduce color change reactions prior to development and to promote the persistence of developed color while not interfering with chromatographic transport of the developed reagent.

4,388,272

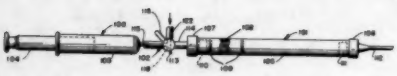
METHOD AND APPARATUS FOR PRECISE CONTROL OF VAPOR PHASE CONCENTRATIONS OF VOLATILE ORGANICS

Robert C. Gesteland, Evanston, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Apr. 8, 1981, Ser. No. 252,039

Int. Cl.[3] B01L 5/00; C09K 3/00; G01N 1/22; A61L 9/04

U.S. Cl. 422—102 14 Claims



1. The method of providing a predetermined concentration of a volatile organic compound in a gas carrier sample, comprising:

(a) applying the volatile organic compound free of any other volatile compound to a solid granular adsorbent to partially coat its adsorptive surfaces, the amount of said compound on said adsorbent being less the minimum amount capable of saturating a gas in contact therewith at an ambient temperature, said compound and said adsorbent being chemically non-reactive;

(b) introducing said organic compound-containing adsorbent into an enclosed space from which gas samples can be selectively removed, said enclosed space containing a carrier gas in contact with said adsorbent at said ambient temperature;

(c) maintaining said adsorbent in contact with said gas until an adsorption-desorption equilibrium is reached so that said gas at said ambient temperature contains a predetermined concentration of said organic compound; and

(d) removing a gas sample from said enclosed space containing said predetermined concentration of said organic compound.

10. An assembly for dispensing gas samples containing a reproducible predetermined concentration of a volatile organic compound, comprising a container with at least one opening to the space enclosed thereby, openable means for closing said opening to seal said container, said space containing a carrier gas in contact with a solid granular adsorbent having a volatile organic compound adsorbed thereon, said organic compound on said adsorbent being free of any other volatile compound and said organic compound and said adsorbent being chemically non-reactive, the amount of said organic compound on said adsorbent being less than 10% of the minimum amount capable of saturating said carrier gas at 25° C., said gas containing a substantially equilibrium concentration of said organic compound.

4,388,273

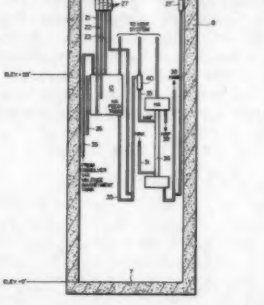
APPARATUS FOR PREVENTING THE DIVERSION OF PLUTONIUM IN NUCLEAR FUEL REPROCESSING

Walter A. Graf, Jr., Saratoga, and Robert C. Breisch, Santa Clara, both of Calif., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Oct. 30, 1979, Ser. No. 89,524

Int. Cl.[3] G05B 9/05

U.S. Cl. 422—117 5 Claims



1. In a nuclear fuel reprocessing plant using plutonium, the improvement comprising:

(a) an enclosed cell for housing nuclear fuel reprocessing equipment, said cell having side and bottom walls and a removable top wall, wherein said walls shield personnel from radiation emitted from reprocessing streams and for physically isolating the equipment from plant personnel;

(b) means within the cell for reprocessing spent nuclear fuel;

(c) means within the cell for containing plutonium solution in a liquid state; and

(d) an arrangement of components within said cell including a plurality of conduits, each of which has one end in fluid communication with the plutonium solution in said containing means and a second end accessible to personnel outside of the cell, said arrangement of components being configured to prevent an individual located outside said cell from being able to cause plutonium solution within said container means to pass through said conduits from their ends in fluid communication with the plutonium solution to their second ends, whereby to prevent individuals outside said cell from gaining access to said solution by means of said conduits.

4,388,274

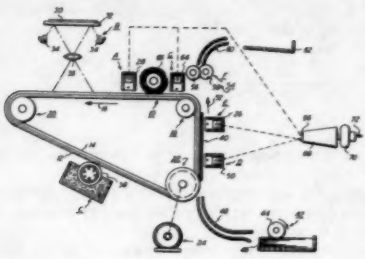
OZONE COLLECTION AND FILTRATION SYSTEM

John L. Rourke, Fairport; Jack C. Azar, Rochester, and William K. Murphy, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 155,349, Jun. 2, 1980, abandoned. This application Dec. 18, 1981, Ser. No. 332,024

Int. Cl.³ B01D *53/56*

U.S. Cl. 422—177 14 Claims



1. An apparatus for the collection and removal of ozone and other noxious gases generated by corona discharge devices in an electrostatographic copying machine which comprises: at least one corona discharge device comprising a housing, a corona emission electrode mounted in said housing, and an apertured plenum mounted in said housing away from the path of the corona emission, said apertured plenum having a surface adjacent said corona emission electrode for biasing the corona emission; an ozone and other noxious gases filtering device comprising a low pressure drop fixed bed filter having a large bed area to volume ratio; conduit means connecting the apertured plenum in said corona discharge device with an air inlet in said filtering device; and air circulation means communicating with said apertured plenum, said conduit means and said filtering device for collecting air containing ozone and other noxious gases therethrough.

4,388,275

APPARATUS CONTAINING A CARRIER MATRIX FOR CATALYSTS

Gerhard Fratzer; Bernhard Beck, both of Rheinfelden; Erwin Dold, Wyhlen, and Hans Klebe, Rheinfelden, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 102,581, Dec. 11, 1979, Pat. No. 4,271,044. This application Jan. 23, 1981, Ser. No. 229,608

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, 2853547

The portion of the term of this patent subsequent to Jun. 2, 1998, has been disclaimed.

Int. Cl.³ B01J *35/04;* F01N *3/22*

U.S. Cl. 422—180 6 Claims

1. In an apparatus for the purification of exhaust gases and the conversion of the harmful components thereof into harmless components, comprising a steel jacket or housing and having contained therein a catalyst effective for said conversion which catalyst is deposited on a carrier matrix for catalysts with flow channels passing therethrough, the improvement comprising a carrier matrix formed of alternately smooth and corrugated superimposed layers of high temperature resistant and scale resistant steel, wherein a layer of corrugated sheet metal alternates with a layer of smooth screen cloth, or one layer of smooth sheet metal alternates with a layer of corrugated screen cloth, or a layer of corrugated screen cloth alternates with a layer of smooth screen cloth, whereby a cross-flow effect of gases is obtained as well as enlarged geometric surface and improved retaining capacity with respect to catalysis promoting metal oxides present in a dip dispersion.

4,388,276

DEVICE FOR REGENERATING HYDROCHLORIC COPPER CHLORIDE ETCHING SOLUTIONS

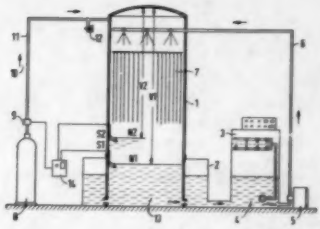
Efthimios Konstantouros, Munich, and Karl Hoeck, Benediktbeuern, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 17, 1981, Ser. No. 293,087

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1980, 3035864

Int. Cl.³ C03C *25/06*

U.S. Cl. 422—187 8 Claims



1. In a device for regeneration of spent hydrochloric copper chloride etching solution which is utilized in printed circuit board manufacture for etching non-galvanized printed circuits, wherein etching and regeneration occur in separate etching and regeneration means between which the etching solution is circulated cyclically or continuously and regeneration occurs with an oxidizing gas, the improvement comprising wherein: in combination

said regeneration means comprises;

an enclosed regeneration housing positioned in a flat upright container which holds a hydrochloric copper chloride etching solution therein, said housing having an interior wall defining a chamber in fluid communication with said upright container;

a means for providing an oxidizing gas in controllable fluid communication with an upper area of said chamber, said oxidizing gas being selected from the group consisting of oxygen, chlorine and a mixture of oxygen and chlorine;

said etching means including a means for providing spent hydrochloric copper chloride etching solution in fluid communication with said upright container and with said upper area of said chamber;

means for spraying said spent etching solution into said upper area of the chamber for contacting said etching solution with said oxidizing gas so that regeneration of said etching solution occurs, consumption of at least a portion of said oxidizing gas occurs and regenerated etching solution collects in said upright container from where such regenerated solution flows back to said etching means; and

two level switch means positioned at different levels along the interior wall of said regeneration housing within the chamber thereof for respectively opening and closing said means for providing an oxidizing gas so as to equalize the subatmospheric pressure arising within said chamber because of gas consumption and thus maintain the relatively slow increase of etching solution within said chamber within optimum limits.

4,388,277

CATALYST DEVICE AND METHOD

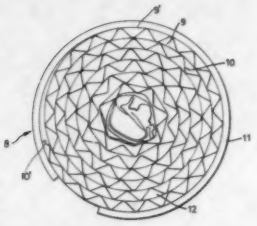
Christopher J. Wright, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jun. 1, 1981, Ser. No. 269,394

Claims priority, application United Kingdom, Jun. 6, 1980, 8018652

Int. Cl.³ B01J 8/02, 35/02

U.S. Cl. 422—211 6 Claims



1. In a method of catalysis of a chemical reaction which comprises passing a reactant or reactants for the reaction through a device under conditions for the catalytically active material to effect catalysis of the reaction, said device comprising a container having a fluid inlet thereto and a fluid outlet therefrom and a plurality of discrete catalyst bodies randomly assembled therein, each body carrying a surface coating comprising catalytically active material for the reaction, the improvement wherein each body is right cylindrical in shape and has a plurality of internal channels of an ordered, predetermined size disposed in substantially parallel arrangement with respect to one another to permit substantially unrestricted flow of fluid through the body, each body having from 25 to 200 hannels per sq cm in a plane at right angles to the direction of the channels, and each body having a protective external boundary to protect the body from attrition.

2. In a device for use in the catalysis of a chemical reaction comprising a container having a fluid inlet thereto, a fluid outlet therefrom and a plurality of discrete catalyst bodies randomly assembled therein, each body carrying a surface coating comprising catalytically active material for the reaction, the improvement wherein each body is right cylindrical in shape and has a plurality of internal channels of an ordered, pre-determined size disposed in substantially parallel arrangement with respect to one another to permit substantially unrestricted flow of fluid through the body, each body having from 25 to 200 channels per sq cm in a plane at right angles to the direction of the channels, and each body having a protective external boundary to protect the body from attrition.

4,388,278

PURIFICATION BY HYDROGENATION OF HYDROGEN CHLORIDE CONTAINING ACETYLENE OBTAINED BY THE THERMAL CRACKING OF 1,2-DICHLOROETHANE

Ludwig Schmidhammer, Haiming; Gerhard Dummer, Burgkirchen, and Rudolf Straszer, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 29, 1981, Ser. No. 316,521

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1980, 3043442

Int. Cl.³ C01B 7/07

U.S. Cl. 423—488 5 Claims

1. A process for reducing the amount of acetylene in a hydrogen chloride stream obtained from cracking of 1,2-dichloroethane, at a pressure of from 8 to 20 bar absolute by hydrogenating the acetylene in a catalytic reactor which comprises:

(a) mixing hydrogen with the hydrogen chloride stream containing acetylene, at a temperature below about 70° C., and at about a molar ratio H, of hydrogen:acetylene, determined according to equation I;

$$H = 10A + 1 \qquad I$$

wherein A is the molar percent of acetylene in the hydrogen chloride stream;

(b) heating the hydrogen chloride stream mixed with hydrogen to a temperature to provide a gas stream, at the outlet of the catalytic reactor, at about a temperature T, between about 120° C. and 180° C., said temperature T being determined according to equation II;

$$T = \frac{388 - 0.5\,p}{1 - (2.78\,p + 11.3) \times 10^{-5} \times R/p}$$

wherein

(1) T is the temperature in degrees Kelvin of the gas mixture leaving the reactor;

(2) R is the volume flow rate expressed as liters of gas, measured at standard temperature and pressure per liter of catalyst per hour; and

(3) P is the pressure of the gas mixture in bar absolute,

and wherein the dwell time of the gas mixture, at a temperature of above about 70° C., before entering the catalyst bed is not more than 0.8 seconds,

(c) contacting the hydrogen chloride stream containing hydrogen with a catalyst comprising platinum, palladium, their oxides or mixtures thereof supported on a carrier comprising an oxide of aluminium, an oxide of silicon or mixtures thereof having a specific surface area of not more than 5 m^2/g.

4,388,279

RECOVERY OF METAL VALUES FROM ORGANIC REACTION PRODUCTS

Michael H. Quick, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 3, 1981, Ser. No. 270,203

Int. Cl.³ C01G 55/00

U.S. Cl. 423—22 2 Claims

1. A process for the recovery of rhodium metal complex catalyst from a liquid hydroformylation alcohol reaction product obtained from treatment of an olefinic hydrocarbon with hydrogen and carbon monoxide in the presence of said rhodium metal complex catalyst at hydroformylation conditions, which recovery process comprises treating said hydroformylation alcohol reaction product with an effective amount of ammonia to remove the bulk of the rhodium contained therein, separating the alcohol product solution containing residual amounts of rhodium, thereafter contacting said solution with solid calcium sulfate at adsorption conditions to separate such residual rhodium from the solution and recovering rhodium valves.

4,388,280

EXTRACTION OF ALUMINUM FROM CLAY

William G. Gruzensky, Lebanon, and Richard S. Olsen, Albany, both of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 289,613, Aug. 3, 1981, abandoned. This application Jun. 17, 1982, Ser. No. 389,307

Int. Cl.³ C01F 7/20

U.S. Cl. 423—131 4 Claims

1. A process for recovery of aluminum from raw kaolinitic clay comprising:

crushing the clay to a particle size of about minus 14-mesh;

subjecting the crushed clay to agitation in the presence of water in the form of a fine mist, the amount of water being sufficient to form a dense, compacted surface on the indi-

vidual particles, but not sufficient to cause agglomeration of the particles, whereby any submicron-size dusts are agglomerated on the surfaces of the larger clay particles;

drying the thus-treated clay at a temperature of about 100° to 350° C. and for a time of about 24 hours to 1 hour to cause the particles to shrink and harden, and to cause submicron-size dusts to become firmly attached to the surfaces of the larger clay particles;

calcining the dried clay; and

subjecting the calcined product to treatment with an acidic leach solution, whereby aluminum is leached from the clay.

4,388,281

NOXIOUS-COMPONENT REMOVAL FROM FLUE GAS AND COMPOSITIONS USEFUL THEREFOR

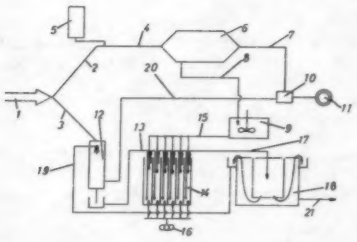
Heinz Hölter, Beisenstrasse 39-41, D-4390 Gladbeck; Heinz Gresch, Franz-Lehar-Strasse 25, D-4600 Dortmund-Wickede; Heinrich Igelbüscher, Marq-en-Baroeul-Str. 60, and Heribert Dewert, Bahnhofstrasse 23, both of, D 4390 Gladbeck, all of Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,291

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3020016; May 24, 1980, 3020049; Jul. 8, 1980, 3025778; Mar. 21, 1981, 3111268; Apr. 4, 1981, 3113788; Apr. 23, 1981, 3116086; Apr. 28, 1981, 3116701; Apr. 28, 1981, 3116702

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—210 **21 Claims**



1. A method for removing noxious components from flue gas before releasing it into the atmosphere which comprises:

dividing the flue gas into two parts, subjecting one part to dry purification and subjecting the other part to wet purification,

the dry purification comprising contacting the one part with a powdery sorption agent selected from the group consisting of calcium oxide and calcium hydroxide to remove noxious components therefrom,

the wet purification comprising incorporating at least one substance selected from the group consisting of calcium hydroxide and calcium oxide in washing liquid and contacting said other part with the washing liquid to remove noxious components therefrom,

the substance incorporated in the washing liquid comprising used sorption agent from the dry purification.

4,388,282

METHOD FOR REGENERATION OF SODIUM SULFITE FROM SPENT FLUE GAS DESULFURIZATION PROCESSES

Eng J. Chou, Piscataway, and Bruce Weinstein, North Bergen, both of N.J., assignors to Research-Cottrell, Inc., Somerville, N.J.

Filed Dec. 22, 1981, Ser. No. 333,410

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—242 **5 Claims**

1. A process for regeneration of a spent sodium sulfite slurry from a flue gas desulfurization absorber employing in the absorption tower Na_2SO_3 comprising carrying out the regeneration in a plurality of serially arranged reactors, adding crushed limestone to the first in the series of reactors, separating the slurry from the reactors in at lest one hydroclone, directing the overflow from the at least one hydroclone to a thickener, directing the underflow from the at least one hydroclone to at least one of the plurality of reactors and utilizing the liquid from the thickener to provide at least a portion of the slurry for the absorber.

4,388,283

SO_2 REMOVAL

Jack Z. Abrams, and Robert M. Sherwin, both of San Rafael, Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 181,315, Aug. 25, 1980, abandoned, which is a continuation of Ser. No. 406, Jan. 2, 1979, Pat. No. 4,246,245. This application Feb. 18, 1982, Ser. No. 349,728

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—242 **3 Claims**

1. A method for removing sulfur dioxide from sulfur dioxide containing flue gas resulting from the burning of sulfur containing fossil fuel, said method comprising:

in a spray dryer introducing into a stream of said flue gas fine particles of an aqueous dispersion of Type S hydrated dolomitic lime in an amount sufficient to remove at least about 70% of the sulfur dioxide present in said flue gas, while reducing the temperature of said flue gas from 240°–350° F. to not lower than a temperature in the range of about 145° to 165° F., wherein the amount of the aqueous dispersion introduced is less than the amount which would result in condensation at said lower temperature; and

separating the resulting substantially dry particles from the effluent.

4,388,284

DRY PROCESS FOR PRODUCING DIBORANE

Sheldon G. Shore, Columbus, and Mark A. Toft, Amlin, both of Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Filed Sep. 18, 1981, Ser. No. 303,387

Int. Cl.³ C01B *6/10*

U.S. Cl. 423—295 **11 Claims**

1. A process for producing diborane comprising reacting lithium or sodium borohydride with boron trifluoride in the absence of a solvent at a reaction temperature of about 0° C. to about 50° C., said lithium or sodium borohydride and said boron trifluoride being present in a molar ratio of about 1:1 to about 3:4 and said reaction being conducted by bringing said boron trifluoride into contact with said lithium or sodium borohydride while said boron trifluoride is in the liquid state and the resultant mixture is allowed to warm to said reaction temperature.

4,388,285

PROCESS FOR THE PREPARATION OF ZSM-5 UTILIZING TRANSITION METAL COMPLEXES DURING CRYSTALLIZATION

Lillian A. Rankel, Princeton, N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,285

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—329 **4 Claims**

1. In the process for the synthesis of ZSM-5 from a forming solution containing a mixture of alumina, silica, alkali metal oxide and water, the improvement which comprises adding a complex selected from the group consisting of metal or hydrogen phthalocyanines, iron cyclopentyldienyl complexes and metal complexes containing a —N—C—C—N— aromatic grouping

to the reaction mixture and maintaining the same at a temperature of from about 100° F. to about 400° F. until crystals of ZSM-5 are formed.

4,388,286

SILICON PURIFICATION

Vijay K. Kapur, Northridge, and Uppala V. Choudary, Chatsworth, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 27, 1982, Ser. No. 343,046
Int. Cl.³ C01B *33/02*
U.S. Cl. 423—348 7 Claims

1. A method for refining silicon particles which are contaminated with carbon and other impurities to produce high purity silicon comprising vacuum refining the silicon particles in an inert atmosphere and at an elevated temperature to form gaseous CO and SiO, thereafter mixing with said silicon an effective fluxing amount of at least one fluoride of a metal selected from the group consisting of alkali metals and alkaline earth metals, heating said mixture at an elevated temperature and for a time sufficient to produce molten silicon and slag as separate phases, separating said slag from said silicon, and recovering said silicon.

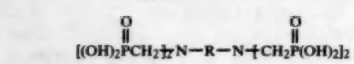
4,388,287

PROCESS FOR PRODUCING SODIUM PERCARBONATE

Junichiro Sugano, Nagoya; Tomoyuki Yui, Yokkaichi; Yoshitugu Minamikawa, Yokkaichi, and Tsuneo Fujimoto, Yokkaichi, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

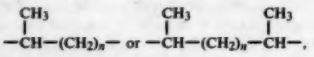
Filed Oct. 27, 1981, Ser. No. 315,651
Claims priority, application Japan, Oct. 28, 1980, 55-151004
Int. Cl.³ C01B *31/00, 15/30*
U.S. Cl. 423—415 P 4 Claims

1. A process for producing sodium percarbonate which consists essentially of reacting sodium carbonate with hydrogen peroxide in the presence of a stabilizer against the decomposition of hydrogen peroxide in a working solution of sodium carbonate, hydrogen peroxide and water, said stabilizer being present in a stabilizing amount and being selected from the group consisting of N,N,N',N'-tetra(phosphonomethyl)-diaminoalkane of the following formula



(A)

wherein R is either



and n is 0 or 1 to 4 mixtures thereof.

4,388,288

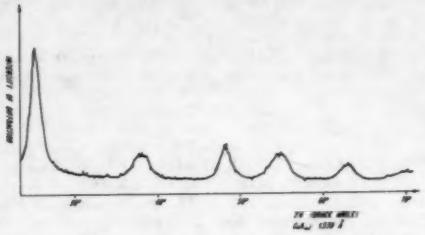
PREPARATION OF SHAPED TITANIUM DIOXIDE CATALYST/CARRIER AND CATALYSIS OF GASEOUS SULFUR COMPOUNDS THEREWITH

Thierry Dupin, Garges les Gonesse; Gilbert Bouge, Salindres, and Regis Poisson, Sevres, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Apr. 23, 1981, Ser. No. 256,978
Claims priority, application France, Apr. 23, 1980, 80 09126
Int. Cl.³ C01B *31/26;* B01J *21/06*
U.S. Cl. 423—416 24 Claims

1. A process for the preparation of a porous shaped titanium oxide catalyst/carrier, consisting essentially of (i) intimately admixing powdered, poorly crystalline and/or amorphous titanium oxide, said titanium oxide powder characterized by a weight loss on ignition ranging from 1 to 50%, water and from 0 to about 15% by weight of a shaping additive, (ii) next shaping the intimate admixture which results, and (iii) thence calcining the shaped article.

3. The process as defined by claims 1 or 2, wherein from about 45 to 99% by weight of the titanium oxide powder and about 1 to 40% by weight of water are intimately admixed.



16. A shaped titanium oxide catalyst/carrier prepared by the process as defined by claim 3.

18. In a process for sulfur removal via Claus catalysis, the improvement which comprises utilizing, as the catalyst/carrier therefor, the shaped titanium oxide catalyst/carrier as defined by claim 16.

4,388,289

METHOD OF REMOVING ALKALI AND ALKALINE EARTH METAL IMPURITIES FROM OXIDIZED PAN MATERIAL

Gary D. Shepherd, Redondo Beach; Ramon B. Fernandez, Hawthorne, and Ian R. Rule, Encino, all of Calif., assignors to Hitco, Irvine, Calif.

Continuation-in-part of Ser. No. 53,756, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 800,784, May 26, 1977, abandoned. This application Apr. 14, 1980, Ser. No. 140,257
Int. Cl.³ D01F *9/22*
U.S. Cl. 423—447.4 10 Claims

1. A method of treating oxidized polyacrylonitrile material to reduce alkali and alkaline earth metal impurities therein to a total content of no greater than 50 parts per million essentially uncarbonized form comprising the steps of contacting oxidized polyacrylonitrile material which is essentially uncarbonized with an aqueous acid solution of at least 0.5% and not substantially greater than 35% concentration by weight for 5–120 minutes, the solution being maintained at a temperature greater than 100° F., removing the aqueous acid solution from the material and rinsing the material with a solvent which is substantially free of alkali and alkaline earth metal ions, the rinsing taking place for 5–30 minutes.

4,388,290

PURIFYING THIONYL CHLORIDE WITH $ALCl_3$ CATALYST

Gerhard Jonas, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 28, 1981, Ser. No. 268,293
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022879
Int. Cl.³ C01B *17/45*
U.S. Cl. 423—468 6 Claims

1. In the purification of thionyl chloride by addition of sulphur and distillation in the presence of a catalyst, the improvement which comprises effecting the distillation in the presence of anhydrous aluminum chloride as catalyst.

4,388,291

PROCESS FOR THE PRODUCTION OF DITHIONITES

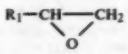
Satoshi Arakawa, Matsudo, Japan, assignor to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 386,059
Claims priority, application Japan, Jun. 18, 1981, 56-94172
Int. Cl.³ C01B *17/66*
U.S. Cl. 423—515 **14 Claims**

1. In the process for producing anhydrous dithionites which comprises reacting (i) formic acid or a formate, (ii) an alkali compound, and (iii) sulfurous acid anhydride in a mixed reaction solvent of water and an organic solvent to form dithionite crystals in a mother liquor, filtering said dithionite crystals from the mother liquor, washing the dithionite crystals with an organic solvent as a washing liquid under conditions which do not cause a slurry to form, and drying the dithionite crystals;

the improvement comprising dividing the washing liquid into two portions which are discharged as (a) the washing liquid first discharged and (b) the washing liquid discharged subsequently, the washing liquid first discharged which contains thiosulfate which inhibits the reaction forming said dithionite and the washing liquid discharged subsequently being collected separately, the washing liquid first discharged is treated by adding thereto at least one compound selected from the group consisting of the compounds represented by the formulae (I) and (II), and cyclohexene oxide; wherein

Formula (I) is



wherein

R_1 is hydrogen, an alkyl group containing from 1 to 8 carbon atoms, a halogenated alkyl group containing from 1 to 2 carbon atoms, phenyl group or a substituted phenyl group;

Formula (II) is R_2—X

wherein

R_2 is a primary or secondary alkyl group containing from 1 to 8 carbon atoms, an allyl group, or a 2-methylallyl or 2-ethylallyl group, and X is halogen, to convert said thiosulfate into a substance which does not exert an adverse influence on the production of dithionites and then recycling said treated washing liquid first discharged as a reaction solvent, and recycling the washing liquid discharged subsequently as a reaction solvent which does not require treatment.

4,388,292

PROCESS FOR REDUCING RADIOACTIVE CONTAMINATION IN PHOSPHOGYPSUM

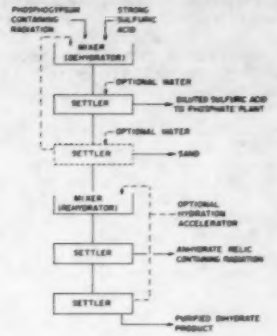
Jay W. Palmer, Temple Terrace, Fla., and John C. Gaynor, Des Plaines, Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Dec. 14, 1981, Ser. No. 330,550
Int. Cl.³ C01F *11/46, 13/00*; C01B *25/16*; G21F *9/28*
U.S. Cl. 423—555 **17 Claims**

1. A process for reducing radioactivity in waste product phosphogypsum containing radioactive contamination comprising the steps of

dehydrating the phosphogypsum to calcium sulfate anhydrite containing radioactive contamination;

in the presence of radiation free gypsum seed crystals rehydrating a substantial proportion, but less than all, of the anhydrite, to a substantially free of radio-activity gypsum of larger particle size than the anhydrite;



and separating the larger particle size gypsum from the anhydrite containing radioactive contamination.

4,388,293

H_2S REMOVAL

Zaida Diaz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 24, 1981, Ser. No. 324,357
Int. Cl.³ C01B *17/04*; B01D *53/34*
U.S. Cl. 423—573 R **20 Claims**

1. A process for the removal of H_2S from a sour gaseous stream comprising:

(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the solution containing an effective amount of a reactant selected from the group consisting of oxidizing polyvalent metal chelate compounds, and mixtures thereof, and a stabilizing amount of a composition selected from the group consisting of thiodiglycolic acid, 3,3-thiodipropionic acid, and mixtures thereof, and producing a sweet gas stream and an aqueous admixture containing crystalline sulfur and a reduced reactant;

(b) removing at least a portion of the crystalline sulfur from the aqueous admixture;

(c) regenerating the aqueous admixture in a regeneration zone to produce a regenerated reactant;

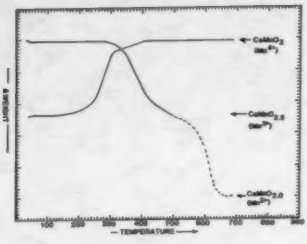
(d) returning aqueous admixture containing regenerated reactant from the regeneration zone to the contacting zone.

4,388,294

OXYGEN DEFICIENT MANGANESE PEROVSKITES

Kenneth R. Poeppelmeier, Edison, and John M. Longo, New Providence, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 31, 1981, Ser. No. 288,996
Int. Cl.³ C01G 45/12
U.S. Cl. 423—599 **14 Claims**



1. An oxygen deficient manganese compound of the composition $Ca_2MnO_{3.5}$ having a perovskite-type structure.

2. An oxygen deficient manganese compound of the composition $CaMnO_{2.5}$ having a perovskite-type structure.

4,388,295

METHOD AND COMPOSITION FOR DETERMINING HUMAN CHORIONIC SOMATOTROPIN

Francesco Cocola, Siena; Paolo Tarli, Monteriggioni, and Paolo Neri, Siena, all of Italy, assignors to Istituto Sieroterapico e Vaccinogeno Toscano "Sclavo" S.p.A., Siena, Italy

Continuation of Ser. No. 902,254, May 2, 1978, abandoned. This application May 30, 1980, Ser. No. 155,019
Claims priority, application Italy, May 12, 1977, 23473 A/77
Int. Cl.³ G01N 33/54, 33/56, 33/58
U.S. Cl. 424—1 **8 Claims**

1. A method for quantitatively determining the presence of Human Chorionic Somatotropin (HCS) in a biological fluid comprising:

(a) forming a complex consisting essentially of an antagonist of HCS with the conjugation product of HCS and a tracer;

(b) introducing said complex into a sample of biological fluid suspected of containing HCS; and

(c) measuring the quantity of tracer which has been set free.

4,388,296

ENERGY-EMITTING LATEX-PARTICULATES

Hiram Hart, 3450 Wayne Ave., Bronx, N.Y. 10467

Continuation-in-part of Ser. No. 890,325, Mar. 27, 1980, Pat. No. 4,271,139. This application Sep. 29, 1980, Ser. No. 192,428
Int. Cl.³ A61K 43/00; G01N 33/56, 33/60
U.S. Cl. 424—1 **8 Claims**

1. Improved energy-emitting latex particulates for use in the non-destructive method of biological fluid assay wherein biological material being assayed links fluid suspensions of both a plurality of tritiated latex particulates and potentially scintillating latex particulates within activating range one to the other, each of said scintillating latex particulates emitting detectable light pulses upon activation responsive to bombardment of energy from each of said linked tritiated latex particulates within said range, said light pulses being quantitatively correlative to the concentration of said biological material in said fluid,

the improvement wherein said tritiated latex particulates, having a polystyrene base with benzotriazole, coated covalently with an antibody, and said scintillating latex particulates having a polystyrene base with 2,5-diphenylfuran and p-bis (α-methylstyrl) benzene, coated covalently with an antibody.

4,388,297

STABLE TOCICANT COMPOSITIONS OF CHLORPYRIFOS

David H. Naffziger, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 161,101, Jun. 19, 1980, abandoned. This application Apr. 27, 1981, Ser. No. 258,099
Int. Cl.³ A61K 31/74; A01N 57/00, 57/26, 27/00
U.S. Cl. 424—78 **8 Claims**

1. A stable insecticidally active composition which is in the form of a solution which is dispersible in water to form a stable emulsion and which comprises the following components: (A) from about 1 to about 50 percent by weight of total composition of chlorpyrifos, (B) from about 10 to about 80 percent by weight of total composition of a Castor Oil based nonionic surfactant containing from about 5 to about 55 moles of ethylene oxide chemically combined with each mole of Castor Oil and (C) from about 5 to about 50 percent by weight of total composition of an anionic surfactant.

4,388,298

PROPAGATION OF HEMORRHAGIC ENTERITIS VIRUS IN A TURKEY CELL LINE AND VACCINE PRODUCED

Keyvan Nazerian, East Lansing, and Aly M. Fadly, Holt, both of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 14, 1982, Ser. No. 398,001
Int. Cl.³ A61K 39/12; C12N 7/08
U.S. Cl. 424—89 **6 Claims**

1. A method for the in vitro propagation of hemorrhagic enteritis virus (HEV) comprising:

a. inoculating with said virus a suspension of lymphoblastoid cells in a medium suitable for growth of said cells, wherein said cells have the characteristics of the MDTC-RP-19 cell line; and

b. culturing said inoculated cell suspension under conditions suitable for propagation of said virus.

5. A vaccine for use in the immunization of turkeys and other avian species against hemorrhagic enteritis comprising the supernatant fluid recovered from the in vitro propagation of hemorrhagic enteritis virus (HEV) on a culture of lymphoblastoid cells, wherein said cells have the characteristics of the MDTC-RP-19 cell line.

4,388,299

MODIFIED PASTEURELLA BACTERIA AND VACCINES PREPARED THEREFROM

Carrell J. Kucera, Lincoln, Nebr., assignor to Norden Laboratories, Inc., Lincoln, Nebr.

Division of Ser. No. 135,828, Mar. 31, 1980, Pat. No. 4,293,545. This application Apr. 17, 1981, Ser. No. 255,145
Int. Cl.³ A61K 39/102
U.S. Cl. 424—92 **10 Claims**

1. A modified live *Pasteurella haemolytica* vaccine capable of inducing immunity in bovine, porcine and bovine animal species without serious side effects comprising a vaccinal amount of modified live *Pasteurella haemolytica* bacterial prepared by chemical modification of virulent *Pasteurella haemolytica* strain ATCC No. 31611 with an acridinium salt, and a carrier therefor.

8. A method of vaccinating bovine, porcine and ovine animal species comprising administering to said animals the modified live *Pasteurella haemolytica* vaccine of claim 1.

4,388,300

CLAVULANIC ACID DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN PHARMACEUTICAL COMPOSITIONS

John B. Harbridge, Coulsdon, England, assignor to Beecham Group Limited, England

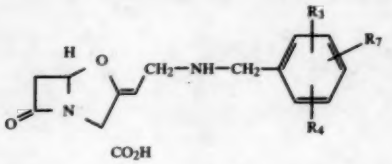
Division of Ser. No. 83,838, Oct. 11, 1979. This application Dec. 10, 1980, Ser. No. 214,776

Claims priority, application United Kingdom, Oct. 25, 1978, 41957/78

Int. Cl.³ A61K *35/00*

U.S. Cl. 424—114 48 Claims

25. A method of treating bacterial infections in humans and domestic mammals which comprises administering to a human or domestic mammal in need thereof a synergistically effective amount of a compound of the formula (II):



(II)

or a pharmaceutically acceptable addition salt thereof wherein R_3 is hydrogen, fluorine, chlorine, alkyl of 1–3 carbon atoms, alkoxyl of 1–3 carbon atoms or alkanoyloxy of 1–3 carbon atoms, R_4 is hydrogen, fluorine, chlorine, alkyl of 1–3 carbon atoms or alkoxy of 1–3 carbon atoms, and R_7 is nitro, cyano, amino or aminomethyl, and an antibacterially effective amount of a penicillin.

4,388,301

METHOD AND COMPOSITION FOR TREATING ACNE

Robert W. Klein, North Wales, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 270,928, Jun. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 139,401, Apr. 11, 1980, abandoned, which is a continuation of Ser. No. 967,485, Dec. 7, 1978, abandoned. This application Apr. 30, 1982, Ser. No. 373,442

Int. Cl.³ A61K *33/06, 33/08*

U.S. Cl. 424—154 18 Claims

1. A method for treating acne and oily skin in a patient in need thereof which comprises topically administering to said patient an effective amount of a composition comprising about 1–20% by weight of total composition of an inorganic polysulfide compound in a carrier comprising a sorbent powder, said polysulfide comprising a sulfurated lime solution an inorganic metallic di- or polysulfide compound of the formula M_2S_n containing unbranched $[S_n]^{2-}$ ions, where M designates a metal and n is any number from 2 to the maximum value of n, which polysulfide upon topical administration itself has an objectionable odor, said powder comprising about 10–70% by weight of at least one montmorillonite clay based on the weight of the total composition and about 2–30% by weight of attapulgite based on the weight of the total composition, said powder being present in an amount to deodorize said composition, to absorb and adsorb the skin oils and to release an effective amount of said polysulfide compound to treat said patient.

4,388,302

COACERVATED IODINE

Charles S. Ecanow, Skokie, Ill., assignor to NeoMed Corporation, Wilmette, Ill.

Filed Apr. 28, 1981, Ser. No. 258,050

Int. Cl.³ A01N *59/12;* A61K *33/22*

U.S. Cl. 424—150 8 Claims

1. A method of preparing coacervated iodine which comprises the steps of:

(a) preparing a two phase aqueous liquid system wherein one phase is a lipoidal non polar aqueous phase, herein also referred to as the coacervate phase, and the second phase is an equilibrium water phase;

(b) adding dissolved urea to the two phase aqueous liquid system of step (a) above;

(c) separating the coacervate phase from the equilibrium water phase;

(d) dissolving crystalline iodine in the coacervate phase which now contains a quantity of dissolved urea.

8. A composition of matter useful as a germicide and antiseptic, prepared according to the method of claim 1.

4,388,303

METHOD TO REDUCE ANIMAL BROWSING DAMAGE TO PLANTS EMPLOYING SELENIUM COMPOUND

George G. Allan, Seattle, Wash., assignor to Board of Regents, University of Washington, Seattle, Wash.

Filed Apr. 6, 1981, Ser. No. 251,156

Int. Cl.³ A01N *43/64, 59/02*

U.S. Cl. 424—162 14 Claims

1. A method to reduce reforestation damage to evergreen seedlings caused by animal browsing comprising the step of applying a compound selected from the group consisting of Na_2SeO_3, $(NH_4)_2SeO_3$, and SeO_2 to the soil around a seedling to promote systemic absorption so that foliage of the seedling contains a level of selenium which repels animals but which is substantially nonphytotoxic to the seedling.

4,388,304

ANGIOTENSIN-II ANALOGUES WITH ANTAGONIZING EFFECTS, CONTAINING AN ESTER GROUP IN POSITION 8, AND A PROCESS FOR THE PREPARATION THEREOF

Olga Nyeki; Lajos Kisfaludy; Egon Karpati, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT, Budapest, Hungary

Filed Jan. 14, 1981, Ser. No. 225,048

Claims priority, application Hungary, Jan. 18, 1980, 101/80

Int. Cl.³ A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 5 Claims

1. A compound of the formula (I)

X—Arg—Val—Tyr—Ile—His—Pro—Ile—OA (I)

wherein

X is L-Sarcosyl or hydroxyacetyl and

A is a C_1–C_5 alkyl group, or a pharmaceutically acceptable acid addition salt or complex thereof.

4,388,305

VINBLASTIN-23-OYL AMINO ACID DERIVATIVES FOR USE AS ANTITUMOR AGENTS

Andre B. L. Trouet, Winksele; Jean A. A. J. Hannart, Dion Valmont, and Kandukuri S. B. Rao, Rosieres, all of Belgium, assignors to Omnichem S.A., Belgium

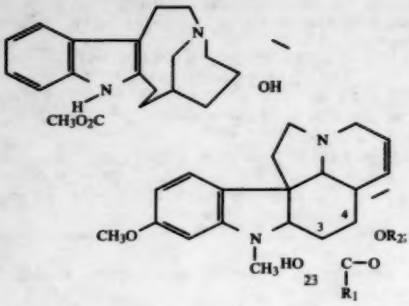
Filed Jun. 3, 1981, Ser. No. 269,876

Claims priority, application Luxembourg, Jun. 10, 1980, 82514; Dec. 23, 1980, 83034

Int. Cl.³ A61K *31/475;* C07D *519/04*

U.S. Cl. 424—177 17 Claims

1. A vinblastine derivative of the formula



wherein R_1 is an ester of a α-aminoacid selected from the group consisting of glycine, alanine, valine, leucine, isoleucine, serine, threonine, aspartic acid, glutamic acid, aspargine, glutamine, arginine, lysine, cysteine, cystine, methionine, phenylalanine, tyrosine, trypthophan, proline, histidine, hydroxy-lysine, hydroxyproline, or of a peptide consisting of 1–6 identical or different such amino-acids, and the ester group, which may be straight or branched, being a carboalkoxy group having 2–9 carbon atoms, and R_2 is hydrogen or a C_2–C_9 alkanoyl group, and their pharmaceutically acceptable mineral or organic acid addition salts.

11. Pharmaceutical composition for use in human or veterinary medicine for treating leukemia, solid tumors treatable with vinblastine, vincristine or vindesine or Hodgkins disease containing a compound in accordance with claim **2** in an amount of about 2–900 mg in a unitary dose.

17. The method of treating leukemia, solid tumors treatable with vinblastine, vincristine or vindesine or Hodgkins disease which comprises administering to a cancer patient in therapeutically effective amount, a compound as defined in claim **2**.

4,388,306

PHARMACEUTICAL COMPOSITION COMPRISING MODIFIED POLYRIBOINOSINIC-POLYRIBOCYTIDYLIC ACID, FOR INDUCTION OF INTERFERON IN PRIMATES

A. Kirk Field, North Wales; Alfred A. Tytell, Lansdale, and George P. Lampson, Hatfield, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 156,295, Jun. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 76,004, Sep. 17, 1979, abandoned. This application Feb. 8, 1982, Ser. No. 346,673

Int. Cl.³ A61K *37/02, 45/02*

U.S. Cl. 424—177 **6 Claims**

1. An interferon-inducing composition comprising a solution in a pharmaceutically acceptable aqueous carrier, of a complex of poly I:C/poly-L-lysine hydrobromide or hydrochloride, the concentration in solution of the poly I:C being from about 1 to about 2 mg/ml, the ratio by dry weight of the poly I:C to the poly-L-lysine hydrobromide or hydrochloride being about 1 to about 0.3, or a molar ratio of 2:1; the poly I having a $S_w20°$ of 11–20, and an $E_{1\%}$ at 248 nm of 240–280; the poly C having a $S_w20°$ of 5–7 and an $E_{1\%}$ at 248 nm of 175–185; and the poly-L-lysine having a molecular weight of from about 10,000 to about 70,000 daltons.

4,388,307

GALENICAL COMPOSITIONS

Thomas Cavanak, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 208,181, Nov. 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 82,487, Oct. 9, 1979, abandoned, which is a continuation of Ser. No. 16,950, Mar. 2, 1979, abandoned. This application Feb. 9, 1982, Ser. No. 347,276

Claims priority, application Switzerland, Mar. 7, 1978, 2461/78; Mar. 14, 1978, 8634/78

Int. Cl.³ A61K *37/00, 47/00*

U.S. Cl. 424—177 **15 Claims**

1. A liquid pharmaceutical composition comprising a pharmaceutically effective amount of a cyclosporin and a carrier comprising the following components:

(a) a trans-esterification product of a natural vegetable oil triglyceride and a polyalkylene polyol;

(b) a vegetable oil; and

(c) ethanol; whrein the ratio of component (a) to cyclosporin is 10:0.2 to 10 parts by weight; the amount of component (b) is 35 to 60% by weight based on the total weight of the composition, and the amount of component (c) is 1 to 20% by weight based on the total weight of the composition.

4,388,308

N^6-[(2-HYDROXYPROPYL)ARYL]ADENOSINES

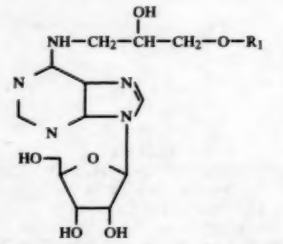
Robert W. Hamilton, Wilmette; Richard E. L. Henderson, Evanston, and Barnett S. Pitzele, Skokie, all of Ill., assignors to G.D. Searle & Co., Skokie, Ill.

Filed Jun. 9, 1980, Ser. No. 157,693

Int. Cl.³ A61K *31/70;* **C07H** *19/16*

U.S. Cl. 424—180 **15 Claims**

1. An N^6-substituted adenosine represented by the formula:



wherein R_1 is selected from the group consisting of naphthyl, acetylphenyl, 2-propenylphenyl and 1, 2-biphenyl; or a pharmaceutically acceptable salt thereof.

4,388,309

PROCESS FOR SUPPRESSING GRAFT REJECTION IN ORGAN TRANSPLANTATION

Hans-Ake Fabricius, Breisach, and Eckart U. Köttgen, Freiburg, both of Fed. Rep. of Germany, assignors to Shanksville Corporation, N.V., Netherlands Antilles

Filed Jun. 10, 1981, Ser. No. 272,130

Int. Cl.³ A61K *31/70*

U.S. Cl. 424—180 **8 Claims**

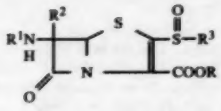
1. A method for inhibiting cell mediated rejection of organ transplants from a donor to a host comprising administering to the host an immunologically suppressive effective amount of from about 0.5 μg to about 10 mg per kilogram body weight per day of a desialylated ganglioside capable of blocking soluble mediators needed for T cell blast formation and proliferation.

4,388,310
6-AMIDO-2-S-OXIDES OF SUBSTITUTED 2-ORGANOTHIO-PEN-2-EM-3-CARBOXYLIC ACIDS

Burton G. Christensen, Cliffside Park; Frank P. DiNinno, Old Bridge; David A. Muthard, Rahway, and Ronald W. Ratcliffe, Matawan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 1, 1982, Ser. No. 353,450
Int. Cl.³ A61K 31/67, 31/43; C07D 277/02, 499/44
U.S. Cl. 424—200 5 Claims

1. A compound having the structural formula:



wherein R is H, a pharmaceutically acceptable salt, or ester moiety, or a removable protecting group; wherein: R^1=H or acyl; R^2 is hydrogen or methoxyl; R^3 is alkyl having 1–6 carbon atoms, phenylalkyl having 7–12 carbon atoms, or cycloalkyl having 3–6 carbon atoms.

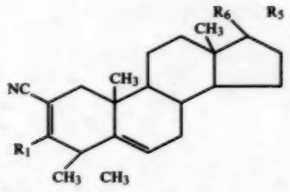
4. An antibacterial pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutically effective carrier therefor.

4,388,311
METHOD FOR THE INDUCTION OF MENSES

Leland J. Chinn, Morton Grove, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed May 6, 1982, Ser. No. 375,619
Int. Cl.³ A61K 31/56
U.S. Cl. 424—238 6 Claims

1. A method for the induction of menses or the termination of pregnancy which comprises administering an amount of a compound of the formula:



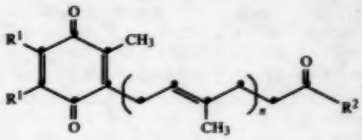
wherein R_1 is:
(a) hydroxy;
(b) R_2COO—;
(c) HOOC—R_3—COO—; or
(d) $R_4C(=O)$—R_3—COO—;
wherein R_2 is:
(a) alkyl of from 1 to 10 carbon atoms inclusive;
(b) oxacycloalkyl group containing from 4 to 7 carbon atoms and one ring oxygen atom; or
(c) cycloalkyl of from 5 to 10 carbon atoms, inclusive,
(d) ring-unsaturated oxacycloalkyl of from 4 to 7 carbon atoms and one ring oxygen atom; or
(e) ring-unsaturated cycloalkyl of from 5 to 10 carbon atoms, inclusive;
wherein R_3 is:
(a) alkylene of from 1 to 10 carbon atoms, inclusive;
(b) cycloalkylene of from 5 to 10 carbon atoms, inclusive;
wherein R_4 is:
(a) alkyl of from 1 to 6 carbon atoms, inclusive;
wherein R_5 is:
(a) hydrogen; or
(b) alkyl of from 1 to 6 carbon atoms, inclusive;
wherein R_6 is:
(a) hydroxy.

4,388,312
QUINONE DERIVATIVES, THEIR PRODUCTION AND USE

Shinji Terao, Toyonaka; Mitsuru Shiraishi, and Kaneyoshi Kato, both of Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 26, 1980, Ser. No. 182,401
Claims priority, application Japan, Sep. 12, 1979, 54/117771
Int. Cl.³ A61K 31/495; C07D 295/18
U.S. Cl. 424—244 8 Claims

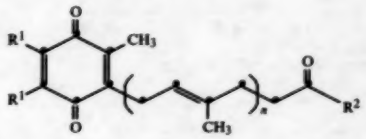
1. A compound of the formula:



(Ia)

wherein n is an integer of 1 to 10,
R^1 is methyl or methoxy, or two of R^1 combine to represent —CH=CH—CH=CH—, and
R^2 is a cyclic amino group selected from the class consisting of azetidinyl, pyrrolidinyl, piperazinyl, piperidino and morpholino,
said cyclic amino groups being unsubstituted or substituted by C_{1-4} alkyl, hydroxyl, C_{1-4} alkoxy, C_{1-4} alkylthio, carboxyl, one of mono- to decaprenyl, benzyl, 3,4,5-trimethoxybenzyl or 3,4-methylenedioxybenzyl,
or its hydroquinone form,
or a pharmaceutically acceptable salt thereof.

8. A method for the treatment of allergosis in a mammal which comprises administering to said mammal an effective amount of a compound of the formula:



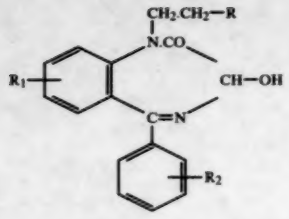
wherein n is an integer of 1 to 10,
R^1 is methyl or methoxy, or two of R^1 combine to represent —CH=CH—CH=CH—, and
R^2 is a cyclic amino group selected from the class consisting of azetidinyl, pyrrolidinyl, piperazinyl, piperidino and morpholino,
said cyclic amino groups being unsubstituted or substituted by C_{1-4} alkyl, hydroxyl, C_{1-4} alkoxy, C_{1-4} alkylthio, carboxyl, one of mono- to decaprenyl, benzyl, 3,4,5-trimethoxybenzyl or 3,4-methylenedioxybenzyl,
or its hydroquinone form,
or a pharmaceutically acceptable salt thereof.

4,388,313
NOVEL 3-HYDROXY-1,4-BENZODIAZEPINE-2-ONES AND PROCESS FOR THE PREPARATION THEREOF

Ludwig H. Schlager, Vienna, Austria, assignor to Gerot-Pharmazeutika Gesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 104,998, Dec. 18, 1979, abandoned. This application May 11, 1981, Ser. No. 262,676
Claims priority, application Austria, Dec. 18, 1978, 9031/78
Int. Cl.³ A61K 31/55; C07D 243/24
U.S. Cl. 424—244 13 Claims

1. A 3-Hydroxy-1,4-benzodiazepine-2-one of the formula



(I)

in which R is CN, R_1 is hydrogen, halogen, trifluoromethyl or nitro and R_2 is hydrogen or halogen.

13. A pharmaceutically active sedative composition comprising a therapeutically effective amount of 1-(cyanoethyl)-7-nitro-3-hydroxy-5-phenyl-1,3-dihydro-2H-1,4-benzodiazepine-2-one together with a material selected from the group consisting of a pharmaceutically acceptable carrier or diluent.

4,388,314

HETEROMONOCYCLIC AND HETEROBICYCLIC DERIVATIVES OF UNSATURATED 7-ACYLAMIDO-3-CEPHEM-4-CARBOXYLIC ACID

Giuliano Nannini; Ettore Perrone, both of Bresso; Dino Severino, Vedasco di Stresa; Giuseppe Meinardi, Milan; Gisella Monti, Milan; Alberta Bianchi, Milan; Angelo Forgione, Milan, and Carlo Confalonieri, Cusano Milanino, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Continuation of Ser. No. 134,788, Mar. 28, 1980, abandoned, which is a continuation of Ser. No. 47,893, Jun. 12, 1979, abandoned, which is a division of Ser. No. 868,665, Jan. 11, 1978, Pat. No. 4,172,892. This application Aug. 21, 1981, Ser. No. 295,074

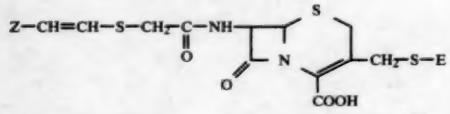
Claims priority, application Italy, Feb. 11, 1977, 20173 A/77

The portion of the term of this patent subsequent to May 15, 1996, has been disclaimed.

Int. Cl.[3] C07D *501/36;* A61K *31/545*

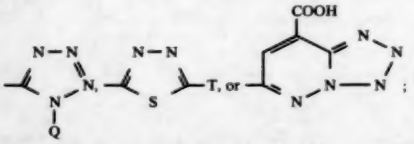
U.S. Cl. 424—246 **9 Claims**

1. A compound of the formula

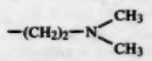


wherein

E is

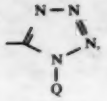


Q is $-C_2H_5$, $-CH_2-CH=CH_2$, $-CH=CH-CH_3$, or



T is amino or $-CH_2COOH$, and

Z is cyano, or, when E is



Z is cyano or carbamoyl, and the pharmaceutically or veterinarily acceptable salts thereof.

4,388,315

CEPHALOSPORINS

Bernd Wetzel; Eberhard Woitun; Roland Maier, all of Biberach an der Riss; Wolfgang Reuter, Laupertshausen; Uwe Lechner, Ummendorf, and Hanns Goeth, Biberach an der Riss, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

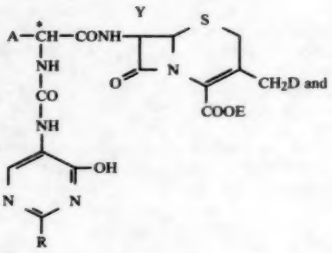
Division of Ser. No. 151,694, May 20, 1980, Pat. No. 4,316,898. This application Sep. 30, 1981, Ser. No. 307,117

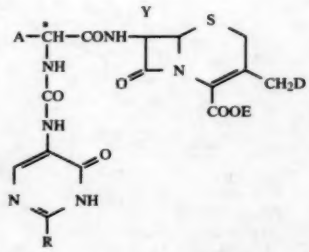
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2924948

Int. Cl.[3] A61K *31/545;* C07D *501/36*

U.S. Cl. 424—246 **24 Claims**

1. A compound of the tautomeric formulas





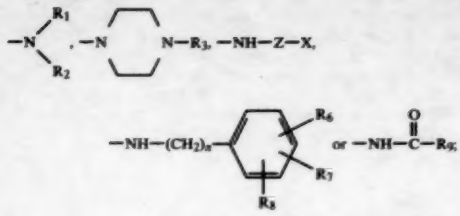
wherein

A is phenyl, 4-hydroxyphenyl, cyclohexyl, cyclohexene-1-yl, cyclohexa-1,4-diene-1-yl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl or 3,4-disubstituted phenyl, where the substituents are each chlorine, hydroxyl or methoxy;

Y is hydrogen or methoxy;

D is S-Het, where Het is 1-methyl-tetrazol-5-yl, tetrazol-5-yl, 3-methyl-1,2,4-thiadiazol-5-yl, 1,2,4-thiadiazol-5-yl, 1,3,4-thiadiazol-5-yl, 2-methyl-1,3,4-thiadiazol-5-yl, 2-methylamino-1,3,4-thiadiazol-5-yl, 2-dimethylamino-1,3,4-thiadiazol-5-yl, 2-formylamino-1,3,4-thiadiazol-5-yl, 2-acetylamino-1,3,4-thiadiazol-5-yl, 2-methyl-1,3,4-oxadiazol-5-yl, 1,2,3-triazol-4-yl or 1,2,4-triazol-3-yl;

R is hydrogen, methyl, cyclopropyl, hydroxyl, methoxy, ethoxy, mercapto, morpholino, thiomorpholino, thiomorpholino-S-oxide, thiomorpholino-S,S-dioxide,

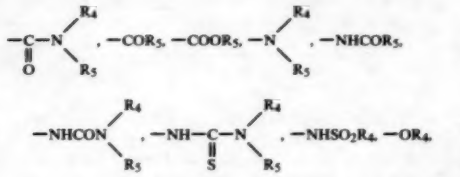


R_1 and R_2 are each hydrogen; straight or branched aliphatic hydrocarbyl of 1 to 6 carbon atoms, optionally containing one to two duble bonds or a triple bond; cycloalkyl of 3 to 6 carbon atoms; or cycloalkyl-alkyl of 3 to 6 carbon atoms in the cycloalkyl moiety and 1 to 2 carbon atoms in the alkyl moiety;

R_3 is formyl, acetyl or ethoxycarbonyl;

Z is alkylene of 1 to 4 carbon atoms or cycloalkylene of 3 to 6 carbon atoms;

X is cyano, hydroxyl, mercapto, amino, aminocarbonyl, aminosulfonyl, aminocarbonylamino,



R_4 is alkyl of 1 to 3 carbon atoms;

R_5 is hydrogen or alkyl of 1 to 3 carbon atoms;

n is 0 or 1;

R_6, R_7 and R_8 are each hydrogen, halogen, amino, alkylamino, dialkylamino, hydroxy, alkoxy, formylamino, acetylamino, aminocarbonylamino, alkylaminocarbonylamino, dialkylaminocarbonylamino, nitro, alkylsulfonylamino, formyl, alkylcarbonyl, alkylcarbonyloxy, alkoxycarbonyl, alkoyxcarbonyloxy, carboxyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, aminocarboxyl, alkylaminocarboxyl, dialkylaminocarboxyl, alkoxycarbonylamino, cyano, mercapto, alkylmercapto, alkylsulfinyl, alkylsulfonyl, aminosulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl, hydroxysulfonyl, or alkyl, where each alkyl moiety in these variants may contain 1 to 3 carbon atoms;

R_9 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 3 carbon atoms, amino, methylamino or dimethylamino; and

E is hydrogen or a protective group which is easily removable in vitro or in vivo;

or, when E is hydrogen, a non-toxic, pharmacologically acceptable salt thereof formed with an inorganic or organic base.

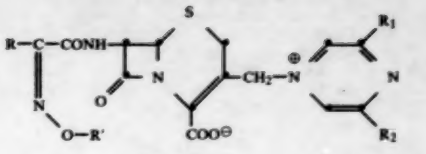
4,388,316

AMINO-SUBSTITUTED OXAZOLE, OXADIAZOLE AND ISOXAZOLE-SUBSTITUTED CEPHALOSPORINS

William H. W. Lunn, and William J. Wheeler, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

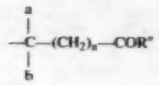
Filed Oct. 2, 1981, Ser. No. 307,989
Int. Cl.³ A61K *31/545*; C07D *501/46*
U.S. Cl. 424—246 **14 Claims**

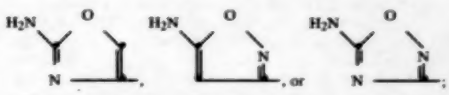
1. A compound of the formula



wherein R is an amino-substituted heterocyclic of the formula

R′ is hydrogen, C_1–C_4 alkyl, or a carboxy-substituted alkyl or carboxy-substituted cycloalkyl group of the formula





wherein a and b when taken separately are independently hydrogen or C_1–C_3 alkyl, and when taken together with the carbon atom to which they are attached form a C_3–C_7 carbocyclic ring; N is 0-3; R″ is hydroxy, C_1–C_4 alkoxy, amino; or R′ is a carbamoyl group of the formula

wherein R‴ is C_1–C_4 alkyl, phenyl, or C_1–C_3 alkyl substituted by phenyl; R_1 is hydrogen, C_1–C_4 alkyl, chloro, amino, C_1–C_4 alkylamino, di(C_1–C_4 alkyl)amino, C_2–C_4 hydroxyalkylamino, or di(C_2–C_4 hydroxyalkyl)amino; R_2 is hydrogen or C_1–C_4 alkyl; and the pharmaceutically acceptable non-toxic salts thereof.

11. The pharmaceutical composition comprising a therapeutically effective amount of a compound of claim **1** and a pharmaceutically acceptable diluent.

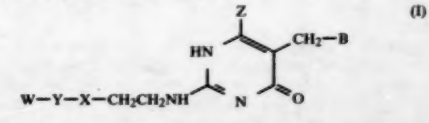
4,388,317

PYRIMIDONES HAVING HISTAMINE H_2-ANTAGONIST ACTIVITY

Thomas H. Brown, Tewin, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Mar. 27, 1981, Ser. No. 248,096
Int. Cl.³ A61K *31/505*; C07D *239/24*
U.S. Cl. 424—248.51 **30 Claims**

1. A compound of formula (I):



(I)

where

W is a 2-furanyl or 2-thienyl group optionally substituted in the 5-position with a group $R^1R^2N(CH_2)_m$—; a phenyl group substituted in the 3- or 4-position with a group $R^1R^2N(CH_2)_m$—; a 4-imidazolyl group optionally substi-

tuted in the 5-position with methyl or bromine; a 2-pyridyl group optionally substituted in the 3-position with C_{1-4} alkyl, C_{1-4} alkoxy, halogen, amino or hydroxy; a 2-thiazolyl group or a 2-guanidino-4-thiazolyl group;

X is methylene or sulphur

and Y is methylene or, provided X is methylene and W is a substituted phenyl group, oxygen;

Z is hydrogen or C_{1-4} alkyl;

and B is a 2-furanyl or 2-thienyl group substituted in the 5-position by a group $R^1R^2N(CH_2)_m$—; a phenyl group substituted in the 3- or 4-position by a group $R^1R^2N(CH_2)_m$— or a 3-pyridyl group substituted in position 5 or 6 or a 4-pyridyl group substituted in position 2 by a group $R^1R^2N(CH_2)_m$;

R^1 and R^2 are C_{1-4} alkyl or together with the nitrogen atom to which they are attached form a pyrrolidino, piperidino or morpholino group;

m is 1 to 4;

or a pharmaceutically acceptable acid addition salt thereof.

4,388,318

METHOD OF TREATING ENDOTOXIN SHOCK WITH A PYRIMIDO-PYRIMIDINE DERIVATIVE

Shozo Koyama; John W. Manning, Jr., both of Atlanta, Ga.; William S. Ammons, Oklahoma City, Okla., and Hector L. Santiesteban, Atlanta, Ga., assignors to Boehringer Ingelheim International GmbH, Ingelheim, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 306,773

Int. Cl.³ A61K *31/505*

U.S. Cl. 424—251 **1 Claim**

1. The method of treating endotoxin shock in a warm-blooded animal in need thereof, which comprises parenterally administering to said animal an effective amount for treating endotoxin shock of 2,2'-[(4,8-bis(diethylamino)-pyrimido[5,4-d]-pyrimidine-2,6-diyl)di-(2-methoxyethyl)imino]diethanol or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,388,319

N-HETEROCYCLIC ALKYL-N'-THIADIAZOLYL, THIAZOLYL AND ISOTHIAZOLYL ALKYLTHIOUREAS, UREAS AND GUANIDINES

Graham J. Durant, and Charon R. Ganellin, both of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 106,080, Dec. 20, 1979, Pat. No. 4,271,169, which is a division of Ser. No. 5,052, Jan. 22, 1979, Pat. No. 4,215,125, which is a division of Ser. No. 770,538, Feb. 22, 1977, Pat. No. 4,152,443, which is a division of Ser. No. 640,525, Dec. 15, 1975, Pat. No. 4,025,527, which is a continuation-in-part of Ser. No. 481,716, Jun. 21, 1974, abandoned. This application Dec. 11, 1980, Ser. No. 215,293

Claims priority, application United Kingdom, Jul. 13, 1973, 33428/73; Nov. 12, 1975, 46732/75

Int. Cl.³ A61K *31/425, 31/415, 31/42, 31/41;* C07D *403/12, 413/12, 417/12*

U.S. Cl. 424—270 **13 Claims**

1. A compound of the formula:

$$Het_1-(CH_2)_{m1}-Z_1-B_1-NHCNH-B_2-Z_2-(CH_2)_{m2}-Het_2$$

wherein one of Het_1 and Het_2 is thiazole, isothiazole or 1,3,4-thiadiazole and the other is imidazole, isothiazole, isoxazole, triazole or 1,3,4-thiadiazole, or when one of Het_1 and Het_2 is isothiazole or 1,3,4-thiadiazole, the other may be oxazole, said Het_1 and Het_2 being optionally substituted by lower alkyl, hydroxyl, halogen or amino; Z_1 and Z_2 are sulphur or a methylene group; B_1 is $(CH_2)_{n1}$ and B_2 is $(CH_2)_{n2}$; m_1 and m_2 are 0, 1 or 2 and n_1 and n_2 are 2 or 3, provided that the sum of m_1 and n_1 and the sum of m_2 and n_2 are from 2 to 4; and X is sulphur, oxygen or NY wherein Y is hydrogen, cyano, $CONH_2$ or SO_2R_1 wherein R_1 is lower alkyl or phenyl, provided that when X is NH, at least one of Z_1 or Z_2 is sulphur, and that when X is NH the sum of m_1 and n_1 is 3 or 4 if Het_1 is imidazole and the sum of m_2 and n_2 is 3 or 4 if Het_2 is imidazole, or a pharmaceutically acceptable acid addition salt thereof.

13. A method of inhibiting H-2 histamine receptors which comprises administering to an animal in an effective amount to inhibit said receptors a compound of claim 1.

4,388,320

3-AMINOPROPOXYARYL DERIVATIVE IN THE TREATMENT OF TREMOR

Erwin Ringwald, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Mar. 3, 1982, Ser. No. 354,454

Claims priority, application United Kingdom, Mar. 9, 1981, 8107305; Jan. 13, 1982, 8200907

Int. Cl.³ A61Y *31/40*

U.S. Cl. 424—274 **8 Claims**

1. A method of treating tremor in animals comprising administering 4-(2-benzoyloxy-3-tert-butylaminopropoxy)-2-methylindole in free base form or in pharmaceutically acceptable acid addition salt form to an animal in need of such treatment.

4,388,321

METHOD FOR INHIBITING GROWTH OF FOOD POISONING ORGANISMS

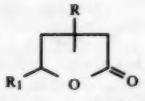
Michael C. Robach, St. Peters, Mo., and Quentin E. Thompson, Belleville, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 6, 1981, Ser. No. 290,446

Int. Cl.³ A01N *43/02;* A23L *3/34*

U.S. Cl. 424—279 **6 Claims**

1. Method of inhibiting growth of yeasts in a food or feed product which comprises contacting said yeast with an effective growth inhibiting amount of a furanone represented by the formula



wherein:

R represents hydrogen or alkyl having up to 10 carbon atoms; and

R_1 represents an ethenyl group.

4,388,322

COMBATING PESTS WITH SUBSTITUTED 3-(1,2-DIBROMO-ALKYL)-2,2-DIMETHYL-CYCLOPROPANE-1-CARBOXYLIC ACID ESTERS

Rainer Fuchs, Wuppertal; Klaus Naumann, Leverkusen; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

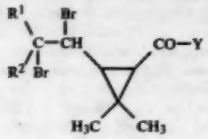
Filed Jan. 19, 1981, Ser. No. 226,290

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1980, 3004092

Int. Cl.³ A01N *37/34;* C07C *121/75*

U.S. Cl. 424—304 **9 Claims**

1. A substituted 3-(1,2-dibromo-alkyl)-2,2-dimethyl-cyclopropane-1-carboxylic acid ester of the formula

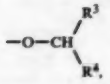


in which

R^1 is phenyl optionally substituted by at least one of halogen, optionally halogen-substituted C_1C_4 alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or C_1–C_2-alkylenedioxy,

R^2 is hydrogen, halogen or optionally halogen-substituted C_1–C_4-alkyl,

Y is



R^3 is hydrogen, cyano or optionally substituted alkyl, alkenyl or alkynyl, and

R^4 is phenyl which is substituted by at least one of halogen and phenoxy which is itself optionally substituted by halogen, alkyl or halogenoalkyl, with the proviso that the phenyl radical contains at least one halogen substituent if R^1 represents methyl or halogen.

4,388,323

ACARICIDE COMPOUNDS

Pietro Massardo; Angelo Longoni, and Paolo Piccardi, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

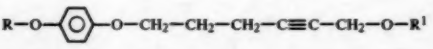
Filed Mar. 17, 1981, Ser. No. 244,591

Claims priority, application Italy, Mar. 28, 1980, 21003 A/80; Nov. 25, 1980, 26205 A/80; Dec. 3, 1980, 26401 A/80

Int. Cl.³ C07C *69/74, 43/235;* A01N *53/00, 31/14*

U.S. Cl. 424—305 **22 Claims**

1. A compound of general formula:



(I)

wherein

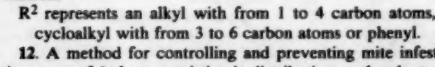
R represents an alkyl with from 8 to 11 carbon atoms;

R^1 represents a hydrogen atom, an alkyl with from 1 to 4 carbon atoms or an alkenyl with from 2 to 4 carbon atoms or

wherein

R^2 represents an alkyl with from 1 to 4 carbon atoms, a cycloalkyl with from 3 to 6 carbon atoms or phenyl.

12. A method for controlling and preventing mite infestations on useful plants consisting in distributing on the plants an effective amount of a compound of general formula:



(I)

wherein

R represents an alkyl with from 8 to 11 carbon atoms;

R^1 represents a hydrogen atom, an alkyl with from 1 to 4 carbon atoms or an alkenyl with from 2 to 4 carbon atoms or

wherein

R^2 represents an alkyl with from 1 to 4 carbon atoms, a cycloalkyl with from 3 to 6 carbon atoms or phenyl as such or in the form of a suitable composition.

4,388,324

PHARMACEUTICAL AND DIETARY COMPOSITION

David F. Horrobin, Montreal, Canada, assignor to Efamol Limited, London, England

Filed May 15, 1980, Ser. No. 150,402

Claims priority, application United Kingdom, May 18, 1979, 7917456

Int. Cl.³ A01N *37/02, 37/00*

U.S. Cl. 424—312 **9 Claims**

1. A pharmaceutical composition for treating alcoholism or moderating the effect of taking alcohol consisting essentially of γ-linolenic acid and/or dihomo-γ-linolenic acid, optionally in association with linoleic acid or other fat acids, said acids being present as such or as physiologically functional ester or other derivative thereof, in combination with ascorbic acid.

4,388,325

L-ARGININE D,L-PYROGLUTAMATE AS A PHARMACEUTICAL AGENT HAVING AN ACTIVITY AT THE NEURO-ENDOCRINAL LEVEL

Giovanni Orzalesi, Florence, Italy, assignor to Societa' Italo-Britannica L. Manetti-H. Roberts & C., Florence, Italy

Filed Jun. 22, 1981, Ser. No. 275,774

Claims priority, application Italy, Jun. 30, 1980, 49111 A/80

Int. Cl.³ A01N *37/12;* A61K *31/195*

U.S. Cl. 424—319 **3 Claims**

1. A method for increasing on a neuro-endocrinal basis sexual activity in male mammals, said sexual activity of which has decreased or become deficient due to specific dopaminergic hypotonicity, comprising administering to said mammals an amount of L-arginine D,L-pyroglutamate effective to increase said sexual activity.

4,388,326

PHENYL HYDROXYPROPYL SULFOXIDE ENZYME INHIBITORS

Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

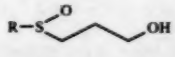
Continuation-in-part of Ser. No. 66,603, Aug. 15, 1979, abandoned. This application May 7, 1980, Ser. No. 147,657

Int. Cl.³ A61K *31/095;* C07C *147/14*

U.S. Cl. 424—335 **4 Claims**

1. The compound 3-p-nitrophenylsulfinyl-1-propanol or a pharmaceutically acceptable salt thereof.

3. A method of inhibiting alcohol dehydrogenase in a patient in need of such treatment which comprises the administration of an enzyme inhibitory amount of a compound of structural formula:



or a pharmaceutically acceptable salt thereof wherein

R is

(a) phenyl, either unsubstituted or substituted with

(1) nitro,

(2) cyano,

(3) C_{1-3} alkylsulfonyl,

(4) C_{1-3} alkoxycarbonyl,
(5) o-C_{1-3} alkyl,
(6) o,o-di(C_{1-3} alkyl), or
(7) di(trifluoromethyl).

4,388,327
METHOD OF INCREASING MILK PRODUCTION OF DAIRY CATTLE
Earl W. Cummins, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.
Filed Oct. 30, 1981, Ser. No. 316,935
Int. Cl.³ A23L *1/30*
U.S. Cl. 426—2 3 Claims

1. A method of improving the milk production of dairy cows which comprises feeding to said cows as part of their diet a feed supplement containing an amount effective to improve milk production of γ-methylmercapto-α-hydroxybutyric acid and its oligomers, which oligomers are about 10 to 75% of the total equivalent free γ-methylmercapto-α-hydroxybutyric acid in said amount of the acid and its oligomers.

4,388,328
SORBITOL CONTAINING MIXTURE ENCAPSULATED FLAVOR
Michael Glass, Flushing, N.Y., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Oct. 15, 1981, Ser. No. 311,572
Int. Cl.³ A23L *1/22*
U.S. Cl. 426—3 15 Claims

1. A method for preparing a flavor composite comprising:
a. preparing a eutectic mixture comprising about 5 to about 6% mannitol; about 0.15 to about 0.16% saccharin, and the remainder sorbitol, said percents being by weight of the final composite;
b. heating said mixture to a temperature of about 200° C.;
c. cooling said mixture to a temperature below 70° C.;
d. adding at least one flavor to said mixture under agitation to uniformly disperse said flavor therein;
e. adding to said mixture under agitation, a quantity of seed particles containing a quantity of sorbitol;
f. permitting said mixture to solidify; and
g. recovering said flavor composite.

4,388,329
PROCESS FOR THE PRODUCTION OF A PASTEURIZED CHEESE IN POWDER FORM
Marcel Buhler, Tolochenaz, Switzerland, and Mats Olofsson, Astorp, Sweden, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland
Filed Jul. 7, 1981, Ser. No. 281,063
Claims priority, application Switzerland, Jul. 11, 1980, 5333/80
Int. Cl.³ A23C *9/16, 19/00*
U.S. Cl. 426—40 10 Claims

1. A process for the production of a pasteurised cheese in powder form which, after reconstitution, has the properties of Mozzarella, and which process does not cause the coagulation of proteins, which comprises
preparing a colloidal lactic starting solution having protein/-lactose and protein/calcium ratios at least about twice as high as those of natural milk and a pH-value in the range from 5.0 to 5.5,
adjusting the solution thus prepared to a pH-value of from 6.3 to 6.4 and heating the pH adjusted solution to a temperature sufficient to pasteurize the solution but below that which would cause the coagulation of proteins it,
returning the pH of the pasteurized solution to a value of from 5.0 to 5.5 and
drying the solution to give the cheese in powder form.

4,388,330
PROCESS FOR THE PREPARATION OF CITRUS JUICE CONTAINING BEVERAGES WITH IMPROVED CLOUD STABILITY
Hendrik J. Wobben, and Hian-Bie Tan, both of Naarden, Netherlands, assignors to Naarden International N.V., Naarden-Bussum, Netherlands
Filed Nov. 26, 1980, Ser. No. 210,561
Claims priority, application Netherlands, Dec. 3, 1979, 7908722
Int. Cl.³ A23L *2/02*
U.S. Cl. 426—51 12 Claims

1. A process for preparing citrus juice products for use in soft drinks and other beverages, which comprises the step of treating juice selected from the group consisting of pasteurized concentrated citrus juice and pasteurized single strength citrus juice with one or more protease enzymes for a time and under conditions sufficient to improve cloud stability when the juice is subsequently employed in soft drinks and other citrus juice containing beverages.

4,388,331
COLLAGEN SAUSAGE CASING
Albert T. Miller, Bridgewater, N.J., assignor to Devro, Inc., Somerville, N.J.
Filed Jan. 23, 1981, Ser. No. 228,005
Int. Cl.³ A23J *3/00*; C12N *11/02*
U.S. Cl. 426—63 4 Claims

1. A method of preparing an edible collagen film comprising:
(a) preparing an extrudable collagen gel containing from 2% to 12% by weight of collagen;
(b) adding to the collagen gel, in an amount of from 0.001 to 0.5 percent, based on the dry weight of the collagen in the gel, a proteolytic enzyme selected from the group consisting of papain, bromelain, ficin, fungal protease, bacterial protease, trypsin, chymotrypsin, and pepsin;
(c) extruding the enzyme-containing collagen gel before sufficient time has elapsed to allow significant hydrolysis of the collagen to form a cohered collagen casing film, thereby immobilizing the proteolytic enzyme; and
(d) reducing the water content of the casing to between 10% and 20%, based on the weight of the casing to reduce the water activity of the casing and render the enzyme non-functioning.

4,388,332
HEAT TREATMENT TEMPERATURE INDICATING FOOD PACKAGE AND PROCESS FOR PROVIDING SAME
Walter W. Egee, Wallingford, Pa., and David A. Rickansrud, Voorhees, N.J., assignors to Campbell Soup Company, Camden, N.J.
Filed Sep. 15, 1981, Ser. No. 302,458
Int. Cl.³ G01K *1/14, 11/12*; B65B *25/00, 55/14*
U.S. Cl. 426—88 7 Claims

1. The method of treating and packaging ground meat, comprising:
placing entirely within a predetermined ball of said ground meat a wireless temperature-recorder device which changes its appearance permanently when heated to at least the temperature required to inactivate the virus of foot and mouth disease;
partially filling the bottom of a food container with ground meat similar to the meat of said predetermined ground meat ball, to a level just below the position of the thermal cold-spot of said container when said container is filled to a predetermined level with said ground meat;
securing said selected ground meat ball to and adjacent a thin, plastic, apertured disc-like holder which has edges adapted to fit inside and against the inner side walls of said container and which is adapted to lie flat on the top of said ground meat partially filling said container, in a predeter-

mined position with said predetermined ground meat ball and said temperature recorder secured thereto adjacent one side thereof and substantially at said cold-spot, said securing of said selected ground meat ball comprising enveloping said selected ground meat ball in a thin flexible material and securing said material to said holder;

placing said holder, with said predetermined ground meat ball secured thereto, in said container transversely of said container and in said predetermined position;

thereafter filling said container with additional ground meat to said predetermined level and sealing it;

and

heating said container and contents, before or after said sealing, to at least said temperature sufficient to inactivate the virus of foot and mouth disease, whereby said temperature-recording device provides a permanent record of said heating to said temperature.

4. A food-package assembly adapted to provide indication that it has been heated sufficiently to inactivate the virus of foot and mouth disease which may be present therein, comprising a moisture proof container, a mass of ground meat filling

said container to a predetermined level, a temperature-recording device within said mass of meat, and an apertured holder for locating said temperature-recording device within said mass of meat, characterized in that:

said holder is of thin disc-like form and has a periphery fitting closely within and against the interior of the side walls of said container when said holder is positioned transversely of said container;

said temperature-recorder device being wireless and positioned entirely within a predetermined ball of said ground meat and said predetermined ball being secured to said holder adjacent one side thereof, said holder being positioned transversely of said container within said mass of ground meat to position said temperature-recording device substantially at the cold-spot of said mass, said ball of ground meat being enveloped in a thin flexible material and said material being secured to said holder; and

said temperature-recording device being of a type which changes its appearance permanently when heated to a temperature at least as high as that required to inactivate the virus of foot and mouth disease.

4,388,333

SIMULATED ADIPOSE TISSUE

Terrence J. Maurice, Colborne; Edward D. Murray, Winnipeg, and Jennifer M. Agnes, Cobourg, all of Canada, assignors to General Foods Inc., Don Mills, Canada

Filed Oct. 26, 1979, Ser. No. 88,493

Claims priority, application Canada, Oct. 10, 1978, 313038

Int. Cl.[3] A23D *5/00, 5/02;* **A23J** *3/00*

U.S. Cl. 426—104 **15 Claims**

1. A process for the production of a simulated adipose tissue consisting essentially of a heat-coagulated matrix of protein with entrapped lipid material and having protein fibres dispersed therethrough, said process comprising:

dissolving and/or dispersing a mixture of proteinaceous emulsifying materials in water, said mixture of proteinaceous emulsifying materials comprising egg white, gelatin and at least one emulsifying protein micellar mass;

emulsifying an edible lipid material with the proteinaceous dispersion to provide a stable oil-in-water emulsion;

incorporating protein fibres in dispersed form in the emulsion; and

heat coagulating said emulsion to a fat-like solid material,

said lipid material, water, proteinaceous emulsifying materials and protein fibres being used in the following percentages by weight:

lipid material—about 65 to about 80

Water—about 15 to about 25

Proteinaceous emulsifying material—about 2.5 to about 7.0

Protein micellar mass—about 1 to about 4.0

Egg white—about to about 2.5

gelatin—about 0.1 to about 1.0

Protein fibres—about 15 to about 45.

4,388,334

MOULD FOR PACKAGING DESSERTS

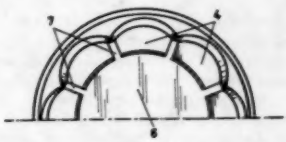
Rene Deveaux, Le Raincy, France, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Division of Ser. No. 158,783, Jun. 12, 1980, abandoned. This application Nov. 27, 1981, Ser. No. 325,219

Claims priority, application France, Jun. 22, 1979, 79 16059

Int. Cl.[3] A23G *1/20, 9/00;* **B65D** *85/72*

U.S. Cl. 426—112 **7 Claims**



1. A packaged dessert comprising:

(a) a mould having a wall structure including a bottom wall and a side wall extending from said bottom wall at the periphery thereof, said bottom wall and said side wall cooperatively defining a cup-like first space, said wall structure defining an opening at the mouth of said cup-like first space remote from said bottom wall, said bottom wall having both a central depression open to said first space remote from said side wall and a plurality of circumferentially spaced elongated grooves or depressions open to said first space extending outwardly from said central depression towards said sidewall and in fluid communication with said central depression, said depression and said grooves cooperatively defining a second space communicating with said first space;

(b) a congealable product solid at the storage temperature of the dessert disposed in said first space; and

(c) a syrup disposed in said second space; the portions of the bottom wall between said circumferentially spaced elongated grooves or depressions supporting said congealable product during filling and storage to prevent mixing of said congealable product and said syrup; said circumferentially spaced elongated grooves or depressions channeling said syrup to the sides of said congealable product during removal of the dessert from the mould.

4,388,335

MICROWAVE BAKING WITH METAL PANS

Robert F. Schiffmann, New York; Alfred H. Mirman, Pomona; Richard J. Grillo, Peekskill, and Robert W. Batey, Port Chester, all of N.Y., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 50,397, Jun. 20, 1979, abandoned, which is a continuation of Ser. No. 700,945, Jun. 29, 1976, abandoned. This application Feb. 12, 1981, Ser. No. 233,755

Int. Cl.³ A21D 8/06

U.S. Cl. 426—243 9 Claims

1. A method for decreasing the time required for baking bread comprising the steps of:

providing an individual loaf of bread dough weighing at least approximately one pound in a metal baking pan;

proofing said loaf in said baking pan;

baking said proofed loaf in said baking pan in a hot air oven at a temperature of 380° to 450° F. for a total baking time of 6 to 14 minutes; and

applying to said proofed loaf in said baking pan microwave energy at frequencies of both 915 MHz and 2450 MHz simultaneously at a predetermined total power flux density in said loaf between 6 and 22 watt-hours per pound of bread divided between said frequencies for a minimum of three minutes during said baking step.

4,388,336

DOUGH PRODUCT CONTAINING AN ORGANIC ACID LEAVENER

Samuel H. Yong; George R. Anderson, both of Minneapolis, and Liza Levin, St. Louis Park, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed May 11, 1981, Ser. No. 262,585

Int. Cl.³ A21D 2/00

U.S. Cl. 426—551 4 Claims

1. An improved dough formulation comprising:

a mixture of flour, water and shortening and at least one leavener including an organic acid leavener incorporated into the mixture; and

at least one of a calcium divalent or trivalent compound and aluminum divalent or trivalent compound in an amount effective to reduce gumminess of less than about 1% by weight of dough.

4,388,337

DRY DESSERT MIX COMPOSITION

Diane Cawdron, Radway, England, assignor to General Foods Limited, Banbury, England

Filed Dec. 28, 1981, Ser. No. 334,767

Int. Cl.³ A23L 1/195

U.S. Cl. 426—573 15 Claims

1. A dry powdered mix composition for mixing with cold milk to produce a ready-to-serve, milk-based preparation having a pH at or below 4.8 comprising 0.5 to 2% by weight of a high methoxy pectin, 5 to 15% by weight of a modified starch, 0.4 to 1.8% by weight of a rapidly dissolving uncoated edible acid selected from the group consisting of citric acid and lactic acid and 2.0 to 4.5% by weight of a slowly dissolving uncoated edible acid selected from the group consisting of adipic acid and fumaric acid, the ingredients and their proportions being selected such that the dry powdered composition when mixed with milk allows the incorporation of acidulents in the milk-based preparation without curdling of the casein.

4,388,338

METHOD FOR PREPARING BEVERAGES IN PORTIONS

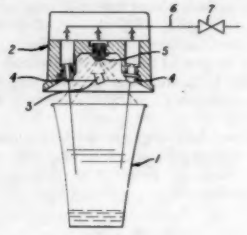
Poul E. Wittenborg, Odense, Denmark, assignor to A/S Wittenborgs Automatfabriker, Denmark

Continuation of Ser. No. 31,998, Apr. 20, 1979, abandoned. This application Apr. 6, 1981, Ser. No. 251,109

Claims priority, application Denmark, Apr. 26, 1978, 1820/78

Int. Cl.³ A23L 2/00; B65B 3/04

U.S. Cl. 426—590 6 Claims



1. A method for preparing beverages at ambient pressures, comprising

(a) adding a premeasured amount of flavored powder to a container;

(b) partially filling said container with a first quantity of water introduced into said container through at least one water supply outlet at a first velocity and a first mass rate of flow; and

(c) substantially simultaneous with step (b), introducing a second quantity of water at a second velocity, which velocity is higher than said first velocity, and a second mass rate of flow, said second mass rate of flow being lower than said first mass rate of flow, through at least one nozzle to substantially fill said container and effectively mix said powder and water to produce a beverage, wherein the diameter of said outlet is larger than the diameter of said nozzle whereby the velocity of said second quantity of water is sufficient to intensively mix by whipping said water and said flavored powder within said container.

4,388,339

MARGARINE AND METHOD FOR MAKING SAME

Richard B. Lomneth; Daniel R. Blair, both of Cincinnati; Gary L. Parnell, Forest Park, and Bernard Y. Tao, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 4, 1981, Ser. No. 318,163

Int. Cl.³ A23D 3/00, 5/00

U.S. Cl. 426—602 18 Claims

1. An edible water-in-oil emulsion spread, which comprises:

(1) an aqueous phase; and

(2) an oil phase comprising a margarine oil product having:

(A) from about 30% to about 65% by weight of a soft oil; and

(B) from about 35% to about 70% by weight phase of a structural fat consisting of:

(a) from about 3% to about 9% by weight SSS triglycerides;

(b) from about 32% to about 50% by weight SOS triglycerides;

(c) from about 5% to about 12% by weight SSO triglycerides; and

(d) from about 20% to about 32% by weight SOO/SLS triglycerides,

wherein S=saturated C_{16} or C_{18} fatty acid residue, O=oleic acid residue, and L=linoleic acid residue;

said fat having a weight ratio of P:St acid residues attached to the glycerides of greater than 8.5 and a weight

ratio of O:L acid residues of from about 4 to about 5, wherein P=palmitic, St=stearic, O=oleic, and L=linoleic,

wherein said spread has a slump grade of at least 8 after 1 hour at 80° F. and a Hot Probe value of at least about 11.3° F./6 sec.

4,388,340
PROCESS FOR THE PRODUCTION OF A FROZEN CHOPPED EGG PRODUCT

Mario P. de Figueiredo, Chesterfield; Balagtas F. Guevara, St. Louis; James L. Long, Creve Coeur; Ronnie G. Morgan, and Lawrence R. York, both of Manchester, all of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 184,584, Sep. 5, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,710

Int. Cl.³ A23L *1/32*

U.S. Cl. 426—614 **18 Claims**

1. A method of forming a chopped egg product comprising:

a. dynamically preheating egg yolks to a product temperature which does not exceed about 183° F. and dynamically preheating egg whites to a product temperature which does not exceed about 167° F. followed by statically heating egg yolks and egg whites at a temperature and time effective to coagulate the yolks and whites.

b. freezing said coagulated yolks and whites,

c. chopping the frozen whites and yolks at a temperature of between about 20°–30° F. to provide a chopped egg mixture without smearing of the yolks.

4,388,341
PROCESS FOR PREPARATION OF FISH MEAT-LIKE FLAKY FOODS

Akira Seto, and Takashi Sakita, both of Yokohama, Japan, assignors to Nisshin Oil Mills, Limited, Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 237,055

Claims priority, application Japan, Feb. 21, 1980, 55-19736

Int. Cl.³ A23J *3/00*

U.S. Cl. 426—656 **6 Claims**

1. A process for preparing a simulated fish-like food flake, comprising the steps of:

providing granulated vegetable protein material having a particle size of about 3 to 10 mesh;

hydrating the granular material in water of about 70° C. to 100° C. having alkali earth metal salt therein in a concentration of about 0.3 to about 1% for a time sufficient to at least toughen said material for forming into flakes;

forming said hydrated granular material into flakes;

washing said flakes; and

dehydrating to a level of about no less than 60% water content and seasoning said flakes.

4,388,342
METHOD FOR CHEMICAL VAPOR DEPOSITION

Takaya Suzuki, Katsuta; Yosuke Inoue, Tokaimura, and Takashi Aoyama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 28, 1980, Ser. No. 154,025

Claims priority, application Japan, May 29, 1979, 54-65552

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—8 **12 Claims**

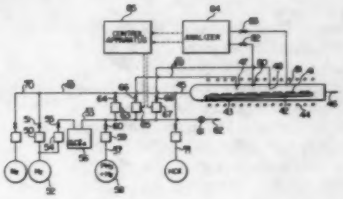
1. A method for chemical vapor deposition of layers of material individually onto the surfaces of a plurality of substrates within a reaction chamber having a primary gas inlet at one end and a gas exhaust at another end, which comprises the steps of:

(a) supporting a plurality of substrates within said reaction chamber with said substrates being arranged in series in a direction extending from the inlet to the exhaust,

(b) supplying a gaseous mixture containing a gaseous compound of said material into said reaction chamber through said inlet and causing the gaseous mixture to flow through the reaction chamber over the plurality of said substrates to said exhaust,

(c) heating said substrates to a temperature at which chemical vapor deposition onto said substrates takes place during the flow of said gaseous mixture through said reaction chamber,

(d) removing a sample of said gaseous mixture from the flow of said gaseous mixture and from said reaction chamber at a position along the series-arranged substrates between said inlet and said exhaust,



(e) measuring a concentration of said gaseous compound in said sample of the gaseous mixture removed from said reaction chamber, and

(f) supplying, in addition to said gaseous mixture, an auxiliary gas which contains said gaseous compound into the flow of said gaseous mixture in said reaction chamber to compensate for the consumed gaseous compound in said reaction chamber in response to the measurement of said concentration of said gaseous compound whereby the chemical vapor deposition in said reaction chamber is maintained substantially uniform along the length of the series-arranged substrates.

4,388,343
METHOD AND APPARATUS FOR LUBRICATING MOLDING TOOLS

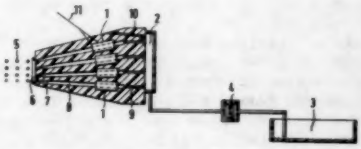
Gunther Voss, Diessen, and Peter Gruber, Biberach, both of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 109,360, Jan. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 94,274, Nov. 14, 1979, abandoned. This application Nov. 30, 1981, Ser. No. 326,168

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 2849496; Aug. 8, 1979, 2932069

Int. Cl.³ B05B *5/02, 5/08;* B05D *1/04*

U.S. Cl. 427—14.1 **11 Claims**



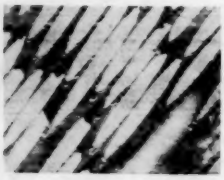
1. In a method of preparing tablets from a granulate material comprising introducing granulate material into a mold die cavity, compressing the granulate material in the mold die cavity with a cooperating punch to form tablets, and ejecting the tablets from the mold die cavity,

the improvement which comprises forming a lubricant film over substantially the entire mating surfaces of the mold die cavity and cooperating punch by selectively dotting liquid or suspended lubricant in specific quantities and in the form of discrete droplets by piezoelectric means onto a small portion of said mating surfaces to provide complete lubrication of the mating surfaces.

4,388,344
METHOD OF REPAIRING SURFACE DEFECTS IN COATED LASER MIRRORS

Alexander J. Shuskus, West Hartford, Conn., and Melvyn E. Cowher, East Brookfield, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 31, 1981, Ser. No. 297,899
Int. Cl.³ G02B *1/10, 5/08*
U.S. Cl. 427—38 **10 Claims**



1250 X

1. The method of repairing surface defects in an amorphous silicon or amorphous germanium deposited coating on a laser mirror substrate comprising forming an oxide layer of the silicon or germanium on the deposited coating by plasma enhanced chemical vapor deposition.

4,388,345
COATING COMPOSITION AND PROCESS FOR PREPARING SYNTHETIC RESIN SHAPED ARTICLES BY USING SAME

Kazuo Kishida, Otake; Isao Sasaki, Hiroshima; Kenji Kushi, and Misao Tamura, both of Otake, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Jan. 27, 1982, Ser. No. 343,221
Claims priority, application Japan, Feb. 4, 1981, 56-15139
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—54.1 **21 Claims**

1. A coating composition which comprises:

(a) a mixture comprised of, based on the weight of said mixture, (i) 25 to 99.95% by weight of at least one polyfunctional monomer having at least three acryloyloxy or methacryloyloxy groups in the molecule, (ii) 0 to 50% by weight of at least one mono- or bi-functional monomer having one or two polymerizable unsaturated groups in the molecule and (iii) 0.05 to 25% by weight of at least one organic acid which has at least one halogen substituent selected from the group consisting of fluorine, chlorine or bromine and which is liquid at normal temperature and pressure, and

(b) 0.01 to 10 parts by weight, based on 100 parts by weight of said mixture, of a photosensitizer.

9. A process for the preparation of a synthetic resin shaped article made of polydiethylene glycol bisallylcarbonate, which comprises coating the surface of a synthetic resin shaped article made of polydiethylene glycol bisallylcarbonate with a coating composition and irradiating the coated shaped article with ultraviolet rays to form on the surface of the synthetic resin shaped article a crosslinked and cured film exhibiting good abrasion resistance and adhesion, wherein said coating composition comprises:

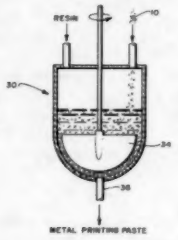
(a) a mixture comprised of, based on the weight of said mixture, (i) 25 to 99.95% by weight of at least one polyfunctional monomer having at least three acryloyloxy or methacryloyloxy groups in the molecule, (ii) 0 to 50% by weight of at least one mono- or bi-functional monomer having one or two polymerizable unsaturated groups in the molecule and (iii) 0.05 to 25% by weight of at least one organic acid which has at least one halogen substituent selected from the group consisting of fluorine, chlorine or bromine and which is liquid at a normal temperature and pressure, and

(b) 0.01 to 10 parts by weight, based on 100 parts by weight of said mixture, of a photosensitizer.

4,388,346
ELECTRODES FOR SOLID STATE DEVICES

James M. Beggs, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Donald B. Bickler, Temple City, Calif.

Filed Nov. 25, 1981, Ser. No. 325,083
Int. Cl.³ H05K *3/12*
U.S. Cl. 427—58 **11 Claims**



1. A method of forming a contact electrode on the surface of an electrical device comprising the steps of:

(1) applying an ink including grains of a conductive, oxidizable, base metal to said surface, said grains containing a coating of a lower melting, sinterable, non-oxidizing metal and being dispersed in a liquid vehicle containing a polymer vaporizable at the temperature of sintering and a minor amount of a vaporizable, fluorocarbon polymer;

(2) heating said surface to vaporize said polymer and said fluorocarbon polymer to etch said surface and to sinter said grains so that they flow to form an adherent, continuous, conductive, contact electrode.

4,388,347
CONDUCTIVE PIGMENT-COATED SURFACES

Ming S. Shum, Des Plaines; Daniel S. Janikowski, Chicago, and Steven A. Bradley, Northbrook, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 206,335, Nov. 11, 1980, abandoned. This application May 17, 1982, Ser. No. 379,208
Int. Cl.³ H05K *3/12*
U.S. Cl. 427—96 **12 Claims**

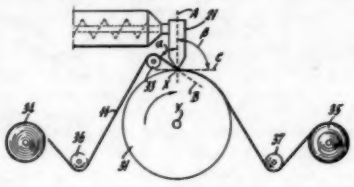
1. A process for the preparation of a conductive pigment-coated surface having enhanced adhesion qualities and enhanced predictable resistivity which comprises alloying a nonnoble conductive metal with from about 12% to about 25% by weight of at least one oxidizable material selected from the group consisting of boron, boron-carbon and boron-silicon, mixing the resulting alloy with an organic vehicle to form an ink, screening said ink onto a substrate, thereafter firing said ink in an oxidizing atmosphere containing about 20% by volume of oxygen at a temperature in excess of about 1000° F. for a period of time sufficient to oxidize said oxidizable material without oxidation of said nonnoble metal, and cooling the thus fired product to produce conductive pigment-coated surface.

4,388,348
Patent Not Issued For This Number

4,388,349
EXTRUSION COATING PROCESS

Ralf Korpman, Bridgewater, and C. Palermo Felice, Asbury, both of N.J., assignors to Permacel, New Brunswick, N.J.

Continuation-in-part of Ser. No. 209,161, Nov. 21, 1980, abandoned. This application Jul. 28, 1982, Ser. No. 402,768
Int. Cl.³ B05D 5/10
U.S. Cl. 427—208.4 **9 Claims**



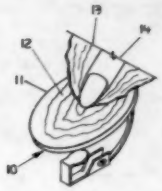
1. A direct extrusion process for preparing a coating substrate from a viscous coating composition which comprises:
(a) feeding the component material or materials of a coating composition into an extruder,
(b) advancing the material or materials forward in the extruder barrel to obtain a molten homogeneous composition, and then through an elongated extrusion die orifice leading from said extruder barrel,
(c) directing a substrate into positive engagement with the outlet opening defined by said extrusion die,
(d) extruding the homogeneous composition through the extrusion die orifice onto the substrate to force the substrate away from said die and forming a uniform coating on said substrate, moving the coated substrate into immediate contact with a closely disposed coating roll, said substrate being drawn to the die orifice from a direction such that the angle α formed between a line representing the direction of approach of the substrate and a line representing the direction of extrusion is less than 90°, and said coated substrate is drawn away from the die orifice in a direction such that the angle β formed between the direction of extrusion and a line representing the initial departing direction of the coated substrate immediately on formation when combined with the angle β is less than 180°.

4,388,350
PROCESS FOR DECORATING ARTICLES

Anne L. Ayers, P.O. Box 233, Daniels, W. Va. 25832

Continuation of Ser. No. 99,922, Dec. 3, 1979, abandoned. This application Dec. 1, 1981, Ser. No. 326,347
Int. Cl.³ B05D 3/12, 5/06
U.S. Cl. 427—262 **12 Claims**

1. A process for decorating an article comprising the steps of
(a) coating said article with a first layer of a colored coating composition containing a solvent solution of a binder;
(b) overcoating said first layer substantially uniformly with one or more subsequent layers of coating composition containing a solvent solution of a binder, each of which is different visually from the preceding layer, in which said solvent for each is a solvent for the binder in the first layer and for the binder in each subsequent layer;
(c) drying each layer before applying a subsequent layer;



(d) while the last of said subsequent layers is wet with said solvent in sufficient concentration to at least soften the binder of any one or more of said underlying layers, redistributing said last and said at least softened underlying layer or layers to form a decorative pattern by exposure of one or more of the underlying layers; and
(e) drying the last and the at least softened underlying layer or layers.

4,388,351
METHODS OF FORMING A PATTERNED METAL FILM ON A SUPPORT

Ernest W. Sawyer, Richmond, Va., assignor to Western Electric Company, Inc., New York, N.Y.

Continuation of Ser. No. 68,298, Aug. 20, 1979, abandoned. This application Dec. 15, 1981, Ser. No. 330,993
Int. Cl.³ B05D 3/04
U.S. Cl. 427—304 **2 Claims**

1. A method of applying a patterned metal film onto a substrate comprising (1) applying a negative mask onto a surface of the substrate whereby portions of the surface are exposed in a positive pattern, (2) forming micropores in the positive pattern portions of the substrate surface, (3) sensitizing the positive patterned portions of the substrate and the negative mask to form thereon a catalytic species capable of catalyzing an electroless metal deposition, (4) electrolessly depositing a thin porous flash metal deposit having a thickness of from 0.003 to 0.020 mils onto the delineated catalytic species in the circuit pattern, (5) removing the negative mask and thereby the catalytic species and flash electroless metal deposit thereon to delineate the catalytic species and flash deposit in the positive pattern on the substrate surface, and (6) electrolessly depositing a metal onto the catalyzed positive pattern.

4,388,352

METHOD FOR PREPARING A CONTROLLED RELEASE COMPOSITION

George G. Allan, Seattle, Wash., and Young C. Ko, Stockholm, Sweden, assignors to Board of Regents, University of Washington, Seattle, Wash.

Filed Aug. 3, 1981, Ser. No. 289,302
Int. Cl.³ B05D *3/02*; D21D *3/00*; D21F *11/00*; A01N *37/38*
U.S. Cl. 427—391 14 Claims

1. A method for preparing a controlled release composition containing an impregnant in a microporous carrier which is initially fluid-filled, comprising the steps of:

(a) immersing the microporous, fluid-filled carrier in a first solution containing the impregnant and a solvent to form a mixture;

(b) distilling the fluid in the carrier's pores from the mixture to exchange the fluid in the pores of the carrier with the solution; and

(c) drying the carrier to entrap the impregnant within the carrier structure.

2. The method of claim 1 wherein the carrier is cellulose pulp.

4,388,353

METHOD AND APPARATUS FOR APPLYING ENAMELS

Raymond W. Hatfield, Warren, Mich., assignor to Michael Ladney, Jr., Grosse Pointe Shores, Mich.

Filed Jul. 22, 1981, Ser. No. 285,314
Int. Cl.³ B05D *1/02*
U.S. Cl. 427—422 7 Claims

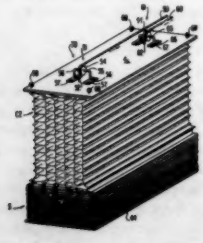
1. The method of applying an acrylic enamel to a workpiece so that the painted surface becomes dust free at an ambient temperature of between about 60° to 70° F. within one to three minutes after spraying which comprises, adding a thermosensitive organic acid catalyst to the enamel for accelerating the curing time of the enamel and directing the enamel through the nozzle of a spray gun supplied with atomizing air at a pressure of 1 to 7 pounds per square inch and at a rate of about 90 and 250 cubic feet per minute, said atomizing air being heated such that its temperature as it issues from the nozzle is between about 110° to 140° F., whereby the heat of the air initiates activation of the catalyst substantially immediately upon discharge of the enamel from the nozzle.

4,388,354

TUBULAR INSULATING CURTAIN AND METHOD OF MANUFACTURE

Heikki S. Suominen, Petsamonk 14, Tampere, Finland

Division of Ser. No. 942,087, Sep. 13, 1978, Pat. No. 4,288,485.
This application Sep. 8, 1981, Ser. No. 300,149
Claims priority, application Finland, Mar. 21, 1978, 780877; Mar. 21, 1978, 780878
Int. Cl.³ B32B *3/12*
U.S. Cl. 428—12 11 Claims



1. A selectively collapsible and expandable curtain having in its fully expanded state a predetermined width, a predetermined height and a plurality of expanded tubes extending across the width of the curtain so as to provide thermal insulating characteristics in the direction of curtain thickness, said curtain comprising:

(a) a plurality of superimposed strips of flexible thin film material, said superimposed strips being adheringly secured together by a plurality of uniformly spaced longitudinally extending bands so as to form superimposed tubes one atop the other in the direction of curtain height, and the length of said superimposed strips being substantially equal to said predetermined curtain width and significantly greater than the width of said superimposed strips in said direction of curtain thickness;

(b) said bands on successive adjoining strips being in a staggered relationship such that each tube when fully expanded has a width substantially defined by a pair of opposing bands on upper and lower adjoining strips and a height substantially defined by upper and lower side sections comprising the portions of said adjoining strips lying between said pair of opposing bands and a pair of transversely spaced bands joining said upper and lower adjoining strips on either side of said opposing bands;

(c) said side bands forming fold lines such that said superimposed strips are substantially flat without folds when said curtain is in a collapsed state; and,

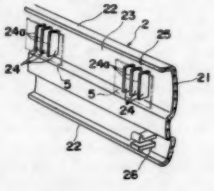
(d) the number of said superimposed strips being such that the combined heights of said superimposed tubes in their fully expanded state are sufficient to provide substantially said predetermined curtain height, each of said tubes when fully expanded having a substantially rectangular cross-section with top and bottom walls defined by said opposing bands and sidewalls defined by said upper and lower side sections and a length along the longitudinal axis of the tube significantly greater than the thickness of the curtain transverse to said axis.

4,388,355

MOLDINGS FOR VEHICLE BODY STRUCTURE

Naoyuki Ikemizu, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Apr. 5, 1982, Ser. No. 365,497
Claims priority, application Japan, Apr. 9, 1981, 56-54074
Int. Cl.³ B60R *13/02*
U.S. Cl. 428—31 7 Claims



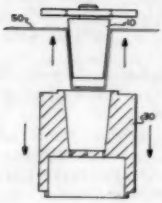
1. A resinous molding for a vehicle body structure which comprises a generally elongated body made of synthetic resin and having a recess defined therein, said recess extending inwardly from one surface of the elongated body and generally over the length of the molding, and a plurality of generally rectangular thin-walled flexible ribs integrally formed with the elongated body and protruding within the recess from the bottom of said recess with a longitudinal axis of each of said flexible ribs oriented generally widthwise of the molding, said ribs being spaced from a peripheral side wall of the body, one face of each of the flexible ribs opposite to the bottom of the recess being adapted to be bonded to an outer surface of the vehicle body structure.

4,388,356

HEAT SETTING A THERMOFORMED PET ARTICLE UTILIZING A MALE PLUG AS A CONSTRAINT

John E. Hrivnak, Clinton, and Robert J. Gartland, Youngstown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 16, 1981, Ser. No. 322,106
Int. Cl.³ B29C 17/04
U.S. Cl. 428—35 20 Claims



1. A heat set polyester article, comprising:

the article made by heating an amorphous sheet of polyethylene terephthalate to a temperature high enough to cause softening thereof;

heating a female mold to a temperature above the glass transition temperature to crystallize said PET sheet;

positioning said softened sheet over the cavity of said female mold;

drawing said softening sheet into said female mold cavity using a male plug, wherein said male plug has dimensions of between about 90% and 99.5% of the dimensions of said female mold;

transferring said softened sheet from said male plug to said female mold by the application of air pressure to said softened sheet;

heating said softened polyester sheet to above its glass transition temperature through contact with said female mold, which causes said polyester to be heat-set thereby;

releasing said air pressure and thus allowing said molded polyester to shrink back onto said male plug and be cooled thereby; and

withdrawing said molded, cooled polyester from said plug.

10. A process for heat setting polyethylene terephthalate, comprising the steps of:

heating an amorphous sheet of polyethylene terephthalate to a temperature above its glass transition temperature;

heating a female mold to above the glass transition temperature of said polyethylene terephthalate to effect crystallization;

positioning said sheet over said female mold cavity;

drawing said sheet into said cavity by means of a male plug maintained at a temperature below the oriented, crystallized glass transition temperature of said sheet, wherein said male plug has dimensions of between about 90 and 99.5% of the dimensions of said female mold;

transferring said stretched polyethylene terephthalate sheet from the surface of said male plug to the surface of said female mold across a gap therebetween; and

allowing said molded polyethylene terephthalate to shrink back onto said male plug and thereby be cooled to a temperature between its glass transition temperature.

4,388,357

SHEET USEFUL AS A RESERVOIR LINER

Robert W. Luebke, Hudson, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Division of Ser. No. 5,699, Jan. 23, 1979, Pat. No. 4,296,884.
This application Jun. 15, 1981, Ser. No. 273,403
Int. Cl.³ B32B 25/10; B65G 5/00; E02B 5/02; E21F 17/16
U.S. Cl. 428—57 4 Claims

1. A liquid impervious flexible liner capable of being packaged in roll form and adapted for use in an earthen reservoir for collecting liquid, such as petroleum based oils, consisting essentially of a layer of pervious non-woven polyester fabric material having secured to at least one of its sides a layer of liquid impervious material, the latter being resistant to degradation by petroleum based liquids, said liner being adapted to generally follow the contour of the upwardly opening earthen reservoir space and being adapted to prevent inadvertent escape or seepage of liquid therefrom, the reservoir being adapted to be generally filled with a relatively coarse particle bed, such as for instance, rock or gravel, disposed on said liner, with the bed being adapted to support thereon a section of railroad track for carrying railway vehicles such as diesel powered locomotives, thereon, the first mentioned layer of said liner being needle punched, liquid pervious relatively low density fabric resistant to puncturing and having a thickness in the range of approximately 60 mils to 190 mils, the second mentioned layer being of rubber and having a thickness of approximately one-third the thickness of said first mentioned layer.

2. A liner in accordance with claim 1 which is comprised of plurality of adjoining strips of predetermined width of the first mentioned and second mentioned materials in said secured relation, and overlapped at the junctures thereof, said junctures being secured together thereat to form said liner.

4,388,358

ADAPTIVE SUPPORT SYSTEM

Thomas A. Davis, Scotch Plains, N.J., and Donald R. Cowsar, Birmingham, Ala., assignors to University of Alabama and Southern Research Institute, both of Birmingham, Ala.

Division of Ser. No. 101,511, Dec. 7, 1979, Pat. No. 4,327,046.
This application Aug. 25, 1981, Ser. No. 296,018
Int. Cl.³ B32B 1/06, 3/18, 3/26
U.S. Cl. 428—71 5 Claims

3. A rigid, shaped, mass support system, comprising a flexible container made of elastic polymeric film containing:

(a) a multiplicity of rigid particles of polystyrene foam spheres having an average diameter of between about 1 and 5 millimeters; and

(b) a cured, polymeric adhesive binder material uniformly distributed among and bonding the rigid particles to form a rigid composite, said binder material comprisng a polyurethane resin which has been cured with a gaseous tertiary amine,

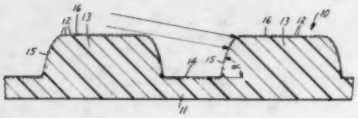
said system being disposable against and conforming to the shape of the mass such as the contour of that portion of a person's body which the system is intended to support.

4,388,359

EMBOSSED PAVEMENT-MARKING SHEET MATERIAL

John L. Ethen, Oakdale, and Timothy D. Bredahl, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 23, 1982, Ser. No. 371,216
Int. Cl.³ B32B 5/16, 3/30
U.S. Cl. 428—143 12 Claims



1. Pavement-marking sheet material comprising a continuous polymeric base sheet having its upper surface configured with a multitude of protuberances which in total occupy at least 10 percent of the area of the base sheet, said protuberances having at least one dimension in the plane of the base sheet that is less than about 15 millimeters, having a height of at least about one millimeter, and having a side surface that is adapted to face oncoming traffic when the sheet material is applied to a roadway and which forms an angle to the plane of the base sheet of at least about 30°, said side surface carrying transparent microspheres at least near the top of the protuberance, which are partially embedded in the surface and partially protrude out of the surface, and the areas of the base sheet between the protuberances being substantially free of protruding microspheres but containing microspheres which have been substantially fully pressed into the base sheet.

4,388,360

MAGNETIC RECORDING MEDIUM

Takahito Miyoshi; Toshimitu Okutu, both of Odawara; Masaaki Takimoto, Tokyo; Takashi Saida, Asaka; Goro Akashi, and Masaaki Fujiyama, both of Odawara, all of Japan, assignors to Fuji Photo Film Company Limited, Kanagawa, Japan

Filed Mar. 9, 1982, Ser. No. 356,540
Claims priority, application Japan, Mar. 9, 1981, 56-33581
Int. Cl.³ H01F 10/02
U.S. Cl. 428—172 10 Claims

1. A magnetic recording medium, comprising:
a nonmagnetic support base;
a magnetic layer on a first surface of said nonmagnetic support base; and
a back coating on a second surface of said nonmagnetic support base, having a thickness of 1μ or less, said back coating being comprised of inorganic particles dispersed in a binder, wherein said inorganic particles include SnO_2 particles.

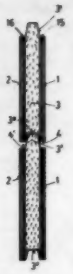
4,388,361

ELEMENT FOR THE INSULATION OF THE OUTER WALL OF A BUILDING

Elio Vassalli, 6852 Genestrerio, Switzerland

Filed Dec. 31, 1980, Ser. No. 221,638
Claims priority, application Switzerland, Dec. 31, 1979, 11484/79; Nov. 19, 1980, 8545/80
Int. Cl.³ E04B 2/18; E04C 1/10
U.S. Cl. 428—192 5 Claims

1. Element for insulation of the external walls of a building, comprising two rigid slabs, and expanded polyurethane insulating material between the slabs which unites the slabs; the insulating material between the two slabs projecting out from between both of the two rigid slabs of the element along one edge of the element and being recessed between both of the two rigid slabs of the element along the opposite edge of the element in such a manner as to leave an interspace on each side of the element between the periphery of the rigid slabs of one element and the periphery of the rigid slabs of the adjacent elements when the insulating material of said one element abuts the insulating material of said adjacent elements, so as to receive mortar to connect the rigid slabs together, said insulating material being laterally outwardly exposed to said mortar in said interspace.

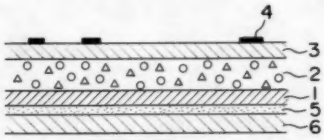


4,388,362

RELEASED HEAT-SENSITIVE RECORDING PAPER

Susumu Iwata, Shizuoka; Keiichi Maruta, and Yukihiro Yuyama, both of Numazu, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1981, Ser. No. 309,661
Claims priority, application Japan, Oct. 17, 1980, 55-144268
Int. Cl.³ B41M 5/18
U.S. Cl. 428—211 10 Claims



1. A releasable, heat-sensitive, recording paper comprising:
(a) a substrate;
(b) a heat-sensitive, color-forming layer superposed on said substrate, said heat-sensitive, color-forming layer consisting essentially of a binder, a colorless or pale leuco dye and an acidic substance adapted to cause said leuco dye to undergo color formation upon heating of said recording paper;
(c) a protective layer superposed on said heat-sensitive, color-forming layer, said protective layer consisting essentially of a water-soluble resin and having a thickness of from 0.5 to 3.0 g/m² in terms of the quantity of the solids thereof;
(d) a pattern of ultraviolet-setting printing ink printed on said protective layer;
(e) a pressure-sensitive adhesive layer superposed on said substrate on the opposite side thereof from said heat-sensitive, color-forming layer and said protective layer; and
(f) a release paper covering said adhesive layer.

4,388,363

COMPRESSIBLE PRINTING ELEMENT CONTAINING THERMOSOL LAMINA

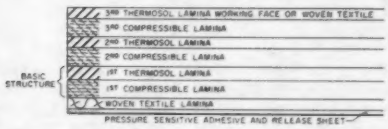
Roy D. Fountain, Lexington, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.

Continuation of Ser. No. 15,020, Feb. 26, 1979, abandoned. This application Aug. 5, 1980, Ser. No. 175,465
Int. Cl.³ B32B 5/18, 3/00; B41N 1/12
U.S. Cl. 428—215 16 Claims

1. A printing element comprising a resilient compressible press packing comprising a compressible lamina having voids and a lamina consisting essentially of a solid heat set thermosol

comprising heat set polyvinyl plastisol, phenolic resin and polyacrylate monomer.

9. A printing element comprising a resilient compressible press packing comprising a compressible lamina having voids and a lamina consisting essentially of a solid heat set thermosol comprising heat set polyvinyl plastisol and polyacrylate monomer wherein the polyvinyl plastisol content of said thermosol is about 30 to about 95% and the polyacrylate monomer content is about 2 to about 20% by weight and wherein said compressible lamina comprises a fibrous sheet impregnated with an impregnant comprising an epoxy resin and said thermsol comprises about 2 to about 30% by weight phenolic resin.



15. A printing element consisting of a resilient compressible press packing comprising a highly porous compressible lamina at least 10 mils thick and a solid thermosol lamina at least 2 mils thick comprising about 70 to about 95% by weight of polyvinyl plastisol and about 3 to about 10% acrylate crosslinked with said polyvinyl forming a thermoset polymer, and a second highly porous compressible lamina at least 10 mils thick on the opposite side of said solid thermosol from the first said highly porpous compressible lamina said thermosol lamina being a single ply in direct contact with each of said highly porous compressible laminas and forming the sole means securing said three laminas together, said press packing being resistant to collapse of said porosity over long use.

4,388,364

HEAT SET WARP KNIT WEFT INSERTED FABRIC AND COATING THEREOF

Kenneth H. Sanders, Jonesville, S.C., assignor to Milliken Research Corportion, Spartanburg, S.C.

Filed Jun. 4, 1982, Ser. No. 385,023
Int. Cl.³ B32B *27/02, 27/12, 27/36*
U.S. Cl. 428—253 **5 Claims**

1. A coated fabric comprising a layer of polymeric material coated onto one side of a heat stretched and set polyester warp knit fabric, said polyester warp knit fabric having a plurality of courses and wales of tricot stitches and a plurality of spaced weft yarns laid into said fabric and held therein by said tricot stitches.

5. A method of making a stabilized coated fabric comprising the steps of: warp knitting a weft inserted substrate fabric from substantially all polyester yarn, heat stretching and setting the polyester fabric after knitting, coating the polyester substrate fabric with a polymeric material and heating the polymeric material to fix the polymeric material to said polyester substrate fabric.

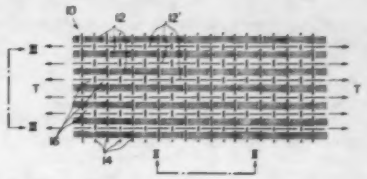
4,388,365

POROUS FRP SHEET AND MANUFACTURING METHOD THEREOF

Shigekazu Hasegawa, Yachiyo, Japan, assignor to Hawegawa Chemical Industry Co., Ltd., Yachiyo, Japan

Filed Feb. 22, 1982, Ser. No. 351,038
Claims priority, application Japan, Mar. 20, 1981, 56-41243
Int. Cl.³ B32B *7/00*
U.S. Cl. 428—258 **2 Claims**

1. A porous FRP (Fiber Reinforced Plastics) sheet containing a woven fabric reinforcing body formed by warp and weft impregnated with cured thermosetting resin, the warp consisting of roving and thread selected from the group consisting of twisted thread or metal thread, the roving being bent above and below the weft, wherein tension is applied to the twisted or



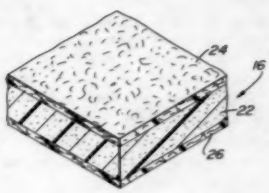
metal thread in the warp so as to affect the tension to the weft so that the roving is rounded and wrapped by the tensed weft.

4,388,366

INSULATION BOARD

Dennis W. Rosato, 256 Fieldboro Dr., Lawrenceville, N.J. 08648, and Neil K. Lister, 150 Elm Ave., Rahway, N.J. 07065

Filed Jun. 21, 1982, Ser. No. 390,249
Int. Cl.³ B32B *17/10, 5/18, 5/32*
U.S. Cl. 428—285 **6 Claims**



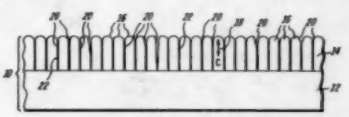
1. An insulation board comprising a plastic foam layer bonded to at least one facing sheet, said facing sheet comprising glass fibers which are randomly dispersed in uniform fashion throughout the sheet, said fibers being bonded together by a bonding agent, and said fibers and bonding agent being coated by a non-wicking agent to provide a porous but liquid-repellant structure.

4,388,367

PERPENDICULAR MAGNETIC RECORDING MEDIUM AND FABRICATION

Tu Chen, Saratoga, Calif., and Pietro L. Cavallotti, Milan, Italy, assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 28, 1981, Ser. No. 306,127
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—323 **19 Claims**



1. A method of producing a continuous thin film magnetic medium comprising a substrate upon which is deposited a thin magnetic layer of Co or alloy thereof, said magnetic layer comprising self-supported, juxtaposed, acicular shaped crystalline particles of magnetic material with the crystallographic "c" axis of the crystal in each particle oriented parallel to the longitudinal axis of the magnetic particle acicula and the longitudinal axis of said magnetic acicular particles oriented substantially normal to the plane of said magnetic layer, said

magnetic acicular particles having a grain boundary of non-magnetic material separating said magnetic particle acicula from one another, said method comprising the steps of

providing an electrochemical plating bath solution containing a Co salt solution having a predetermined Co^{++} ion concentration,

electrodepositing Co on said substrate, and

controlling the precipitation of $Co(OH)_2$ in said bath solution,

the step of controlling comprising the steps of inducing the precipitation of $Co(OH)_2$ at the grain boundaries of said magnetic acicular particles while maintaining the maximum pH value of the Co salt solution at a point before the precipitation of $Co(OH)_2$ would occur in the solution bulk.

4,388,368

MAGNETIC RECORDING MEDIA

Noburo Hibino, and Goro Akashi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 27, 1981, Ser. No. 286,840

Claims priority, application Japan, Jul. 28, 1980, 55/103396

Int. Cl.³ H01F *10/00*

U.S. Cl. 428—336 **8 Claims**

1. In a magnetic recording tape comprising a base film having coated thereon a magnetic recording layer, the improvement wherein said base film comprises a plastic film having a thin glass layer laminated on at least one surface thereof, wherein the thickness of the glass layer is about 0.1 to about 5 μm.

4,388,369

MAGNETIC RECORDING MEDIUM

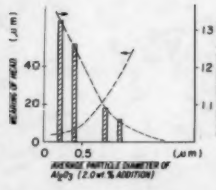
Kiminori Tamai, and Masashi Hayama, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1982, Ser. No. 341,005

Claims priority, application Japan, Mar. 30, 1981, 56-47045

Int. Cl.³ H01F *10/02*

U.S. Cl. 428—339 **1 Claim**



1. A magnetic recording medium comprising a magnetic layer on a base film said magnetic layer comprising a magnetic powder composition in a binder, said magnetic powder composition consisting essentially of a magnetic powder and from 0.1 to 3.0 wt. percent based on said magnetic powder of a mixture of (a) an abrasive powder having an average particle diameter of 0.4 μm or less and (b) an abrasive powder having an average particle diameter of 0.8 μm or more, said abrasive particles having a moh's hardness or greater than 6, wherein the ratio of (a) and (b) is in a range of 1.0:0.08 to 1.0 to 0.33.

4,388,370

ELECTRICALLY-CONDUCTIVE FIBRES

Vincent S. Ellis, and Kazimierz W. Mieszkis, both of Pontypool, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 351,612, Apr. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 297,392, Oct. 13, 1972, abandoned. This application Aug. 26, 1975, Ser. No. 607,949

Claims priority, application United Kingdom, Oct. 18, 1971, 48362/71; Feb. 3, 1972, 5107/72

Int. Cl.³ B32B *9/00*; D02G *3/00*

U.S. Cl. 428—368 **4 Claims**

1. A drawn electrically-conductive fibre of substantially circular cross-section, comprising a fibre substrate formed from two polymeric components in an integral sheath/core configuration, the sheath component having a lower softening temperature than the core component, and finely divided electrically-conductive particles penetrating into the sheath component so as to form a phase independent of the polymeric material of the sheath component in an annular region located at the periphery of the sheath component, the electrically-conductive particles being present in an amount sufficient to render the fibre antistatic.

4,388,371

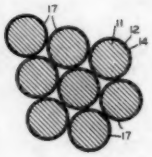
SELF-BONDING ACRYLIC POLYMER OVERCOAT FOR COATED METAL SUBSTRATES

Donald A. Bolon, Scotia, N.Y., and Edith M. Boldebuck, deceased, late of Downers Grove, Ill. (by Jeanette M. Foster, executrix), assignors to General Electric Company, Fort Wayne, Ind.

Filed Jun. 29, 1981, Ser. No. 278,203

Int. Cl.³ B32B *27/30*; H01F *41/06*

U.S. Cl. 428—383 **28 Claims**



1. An insulated heat bondable electrically conductive material comprising an electrically conductive substrate, a base coat on said substrate of electrically insulting, heat resistant, cured resin, and an overcoat of heat curable acrylic polymer upon said base coat forming a non-tacky, flexible, scrape resistant heat bondable acrylic polymer coating thereon.

19. A method of making an insulated, heat bondable metal substrate comprising:

applying a base coat of electrically insulating heat resistant resin to the metal substrate;

curing the base coat resin;

applying an overcoat of acrylic polymer forming composition upon the cured base coat resin; and

partially curing said acrylic polymer coating composition to the B-stage to form a heat bondable overcoat on said base coat resin coated substrate.

20. A method of self-bonding a plurality of turns of a magnet wire defining a coil thereof with the magnet wire having a base coat of an electrically insulated heat resistant resin and an overcoat of heat curable acrylic polymer, the method comprising the steps of:

adhering the base coat to the magnet wire and curing it thereon;

forming the overcoat upon the cured base coat on the magnet wire and partially curing the overcoat to a preselected cure stage less than a generally complete cure stage thereby to form a bondable overcoat;

assembling the turns of the magnet wire into the coil thereof with at least a part of the overcoat of at least one of the turns being in contact with at least a part of at least another of the turns; and

curing the overcoat on the magnet wire to the generally complete cure stage thereof and effecting thereby the bonding together of at least the at least part of the overcoat on the at least one turn of the magnet wire in contact with the at least part of the overcoat on the at least another turn of the magnet wire.

4,388,372

DURABLE ANTISOILING COATINGS FOR TEXTILE FILAMENTS

Nitin J. Champaneria, Seaford, Del.; Lee R. Harper, Media, Pa., and Edward A. Hosegood, Ocean City, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 149,334, May 13, 1980, Pat. No. 4,325,857. This application Mar. 10, 1982, Ser. No. 356,716

Claims priority, application Brazil, May 5, 1981, PI8102732

Int. Cl.³ B32B *27/34, 27/36;* C08L *63/00*

U.S. Cl. 428—395 **7 Claims**

1. A yarn having durable antisoiling properties comprised of filaments of a synthetic polycarbonamide having incorporated therewith a coating composition comprising an aqueous dispersion of (1) a perfluoroalkylester of a citric acid urethane and a fluorinated alcohol having the formula $C_nF_{2n+1}(CH_2)_mOH$ wherein n is 6 to 14 and m is 2 and of (2) the reaction product of

(A) not less than 50% by weight, based on the weight of (A) plus (B), of an epoxy resin containing, on the average, two terminal 1,2-epoxy groups per molecule and having an epoxy equivalent weight of 750–5000;

(B) a carboxyl-functional polymer in an amount sufficient to provide at least 1.25 equivalents of carboxyl groups, when the source of the carboxyl group is a mono-protic acid, and at least 2.0 equivalents of carbosyl groups, when the source of such groups is a diprotic acid, per equivalent of 1,2-epoxy groups in the epoxy resin, said polymer having a weight average molecular weight (determined by light scattering) of about 10000–160000 and an acid number of 100–500;

(C) an aqueous solution of at least 1.25 equivalents of a tertiary amine per equivalent of 1,2-epoxy groups in the epoxy resin, said tertiary amine being selected from the group consisting of $R_1R_2R_3N$, pyridine, N-methylpyrrole, N-methyl piperidine, N-methyl pyrrolidine, N-methyl morpholine, and mixtures thereof and wherein R_1 and R_2 are substituted or unsubstituted monovalent alkyl groups containing one or two carbon atoms in the alkyl portion and R_3 is a substituted or unsubstituted monovalent alkyl group containing 1–4 carbon atoms; and

(D) optionally, 10–90% of the amount required for stoichiometric reaction with the carboxyl-functional polymer of (B) of at least one primary, secondary or tertiary amine or monofunctional quaternary ammonium hydroxide;

wherein Y is at least about $6+0.75(2^X)$ wherein Y is the milliequivalent of carboxyl groups neutralized with primary, secondary or tertiary amine or mono-functional quaternary ammonium hydroxide per 100 grams of acid polymer plus epoxy, and X is the epoxy equivalent weight divided by 1000; and wherein for increasing ratios of carboxyl groups to 1,2-epoxy groups, the amount of amine is increased to keep the carboxyl-functional polymer water dispersible; with said ester being present in said dispersion in a ratio in parts by weight to said reaction product within the range of about 1:1 to 12:1.

4,388,373

COATING PLASTIC SUBSTRATES WITH MINERALS

Frank N. Longo, East Northport; Robert A. Miller, Kings Park, and Joseph D. Reardon, Smithtown, all of N.Y., assignors to Metco, Inc., Westbury, N.Y.

Filed Jun. 2, 1981, Ser. No. 269,437

Int. Cl.³ C08L *63/00*

U.S. Cl. 428—413 **11 Claims**

1. A flame sprayable powder composition suitable for coating a plastic substrate, comprising by weight

(a) about 70 to 98% of a flame sprayable mineral powder,

(b) about 1 to 25% of a nylon powder, and

(c) about 1 to 25% of an epoxy resin powder.

4,388,374

WATER REDUCIBLE COATING COMPOSITIONS

David A. Shimp, Prospect, Ky., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 264,780, May 18, 1981, Pat. No. 4,360,613. This application Aug. 30, 1982, Ser. No. 412,731

Int. Cl.³ B32B *27/38*

U.S. Cl. 428—414 **2 Claims**

1. Ovenable coated paperboard comprising paperboard stock first coated with a sealer coating of a vinyl acetate homopolymer or copolymer, followed by two coats of a cured composition comprising

(A) the reaction product of

(a) about 55 to 90 weight percent of a glycidyl polyether of a dihydric phenol having a molecular weight of about 800 to about 2500;

(b) about 8 to about 44.1 weight percent of a polyethylene glycol having a molecular weight of about 300 to about 2000; and

(c) about 0.9 to about 2 weight percent of ortho phosphoric acid; and

(B) aminoplast resin wherein the total coating has a thickness of about 0.5 to about 1.5 mils.

4,388,375

POLYESTER BASED POLARIZER

Michael J. Hopper, Taylors; Michael R. Martin, Greenville, both of S.C.; Lawrence Bolt, Van Nuys; Michael Smith, Thousand Oaks, both of Calif., and Ali Tavasolian, North Hollywood, Calif., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Nov. 24, 1981, Ser. No. 324,507

Int. Cl.³ B32B *27/40;* G02F *1/13*

U.S. Cl. 428—423.7 **16 Claims**

1. A polarizer prepared by the process which comprises:

(a) extruding a moving molten web of polyester film; and

(b) quenching the moving web to solidify it in a substantially amorphous form; and

(c) applying a coating of a dispersed aqueous composition of polyvinyl alcohol or polyurethane to at least a portion of the surface of said film; and

(d) stretching the moving web in a direction transverse to the direction of motion while heating the web at a temperature of from about its glass transition temperature to about 160° C.; and

(e) crystalizing the transversely restrained moving web by heating it to a temperature in the range of 130° C. to 240° C. without stretching said web; and

(f) cooling said web to substantially ambient atmospheric room temperature; and

(g) adhering a polyvinyl alcohol film to at least a portion of said coating; and

(h) staining said polyvinyl alcohol film in a bath of an iodine containing composition; and

(i) subjecting said polyvinyl alcohol film to concentrated sources of infrared and ultraviolet radiation sufficient to substantially increase the hydrolytic stability of the formed polarizer.

4,388,376

MAGNETIC RECORDING MEDIUM

Yuichi Kubota, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1980, Ser. No. 158,353
Claims priority, application Japan, Jun. 25, 1979, 54-79937
Int. Cl.³ G11B 5/68
U.S. Cl. 428—425.9 7 Claims

1. A magnetic recording medium which comprises a substrate coated with a magnetic powder composition comprising a magnetic powder and an organic binder consisting essentially of as a main component (A) a copolymer consisting essentially of a vinyl chloride-vinyl alcohol copolymer, wherein said copolymer comprises less than 2 mole % of vinyl acetate component and 8 to 22 wt. % of vinyl alcohol component and wherein said vinyl chloride-vinyl alcohol copolymer is obtained by a hydrolysis of a vinyl chloride-vinyl acetate copolymer having a molar ratio of vinyl chloride component to vinyl acetate component of 85:15 to 70:30, with or without a stabilizer for the vinyl chloride-vinyl alcohol copolymer and (B) as a minor component at least one polymer which is an elastomer or soft thermoplastic resin or mixture thereof at a ratio of 50 to 10 wt. % based on the total organic binder.

4,388,377

TAR INHIBITOR COATED LAYER

Fusaoki Uchikawa, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1981, Ser. No. 260,099
Claims priority, application Japan, Jul. 11, 1980, 55/94860
Int. Cl.³ B32B 9/04, 15/04
U.S. Cl. 428—446 5 Claims

1. A tar inhibitor coated layer formed on a wall of a combustion device inhibiting the formation of tar caused by combustion of oil, which coated layer comprises a porous binder, a reducing agent selected from the group consisting of a metal and a metallic salt, and optionally an alkaline metallic salt incorporated in said porous binder.

4,388,378

THERMOPLASTIC HARDBOARD FROM ACETYLATED MAT

Cynthia B. House, Arlington Heights, Ill., and Robert J. Leichti, Auburn, Ala., assignors to United States Gypsum Company, Chicago, Ill.

Filed Dec. 5, 1980, Ser. No. 213,263
Int. Cl.³ B32B 23/04; D21F 11/00
U.S. Cl. 428—537 1 Claim

1. A fiberboard mat prepared by an acetylation process comprising the steps of coating a substantially dry wood fiber mat with from about 35% to about 120% by weight of acetic anhydride, enclosing the coated mat in a sealed space, heating the enclosed mat at from about 150° F. to about 300° F. for from about 20 minutes to about 120 minutes, and removing by-product acetic acid and residual anhydride.

4,388,379

ELECTRODEPOSITION OF LOW STRESS, HARD IRON ALLOY AND ARTICLE SO PRODUCED

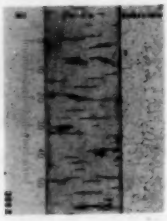
Otto J. Klingenmaier, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 27, 1981, Ser. No. 257,988
Int. Cl.³ C25D 3/56
U.S. Cl. 428—613 5 Claims

1. A method for electrodepositing an iron alloy onto a substrate to form a hard, wear-resistant plate having a relatively low residual tensile stress, said method comprising

immersing the substrate in a high-conductivity aqueous plating solution having a ferrous ion concentration between 90 and 125 g/l, a cobalt ion concentration between 1.8 and 2.5 g/l, a specific resistance less than about 6 ohm-cm at 25° C. and a pH between 0.5 and 2.5, said solution being maintained at a temperature between 56° to 77° C., and

passing direct electrical current through said solution between said substrate as a cathode and an anode to electroplate iron alloy onto said substrate, said current having a density based on the immersed area of the substrate between 5 and 40 A/dm² and effective to deposit a plate containing up to about 6 weight percent cobalt and having a residual tensile stress below 75 MPa and a Vickers hardness above 550 DPH.



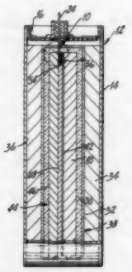
3. An article of manufacture comprising a metal substrate bearing a hard, wear-resistant, adherent electroplate comprising between about 3 to 6 weight percent cobalt and the remainder essentially iron, said plate being characterized by microscopic cracks perpendicular to the substrate surface and in a density greater than about 200 cracks per linear cm at the plate surface, said cracks being effective to reduce the residual tensile stress to below about 60 MPa, said plate being further characterized by a Vickers hardness greater than 550 DPH.

4,388,380

LITHIUM CELL HAVING DEPLETION GAUGE

Abel De Haan, Pembroke Pines, and Harshad Tataria, Miami, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Nov. 16, 1981, Ser. No. 321,350
Int. Cl.³ H01M 10/48
U.S. Cl. 429—91 8 Claims



1. A lithium cell comprising:

an outer conductive housing;

at least one cathode member being positioned within the conductive housing and having two major surfaces one of which is in direct electrical contact with the conductive housing;

an insulative separator being positioned against the outer major surface of the cathode member;

a first lithium anode of a predetermined thickness having first and second major surfaces, said first surface thereof is positioned adjacent to the insulative separator;

a second lithium anode of a predetermined thickness having first and second major surfaces, said first surface thereof is

positioned adjacent to the second surface of the first lithium anode, the first major surface of said second lithium anode having a stepped portion to thereby form a gap between a portion of the first surface of said second lithium anode and the second surface of said first lithium anode;

an anode lead electrically connected to the second lithium anode, said lead extending out of the conductive housing and being electrically insulated from the housing;

an electrical sensing conductor positioned within the gap between the surfaces of the first and second lithium anodes, said electrical conductor being in electrical contact with the first lithium anode;

an insulative pad interposed between said electrical conductor and said second lithium anode; and,

said electrical conductor extending out of said conductive housing and being electrically insulated from said housing so that an electrical potential is developed between the electrical conductor and the conductive housing until the first lithium anode is consumed by discharge of the cell to thereby provide an indication of a predetermined level of discharge of the cell.

4,388,381

ELECTROCHEMICAL STORAGE CELL

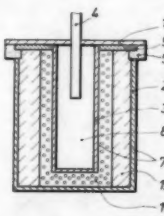
Stefan Mennicke, Leimen-Gauangelloch, and Gert Weddigen, Heidelberg-Handschuhsheim, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Jul. 24, 1981, Ser. No. 286,452

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028836

Int. Cl.³ H01M *10/39*

U.S. Cl. 429—104 **13 Claims**



1. Electrochemical storage cell based on alkali metal and chalcogen with at least one anode space for the alkali metal anolyte and a cathode space for the chalcogen catholyte of sulfur or sulfides and mixtures thereof, with the anode space and the cathode space separated from each other by an alkali-ion conducting solid electrolyte, and at least in some regions are enclosed by a metallic housing, the combination therewith of the outer surface of the solid electrolyte surrounded by a directly adjacent ion-conducting layer, and the inner surface of the metallic housing covered by a directly contacting electron-conducting layer, and wherein the electron-conducting layer borders the ion-conducting layer and conversely, and wherein at least the electron conducting layer is impregnated with sulfur, and wherein the cathode space is filled with the ion-conducting and the electron-conducting layers.

4,388,382

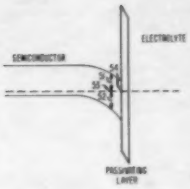
PHOTOELECTROCHEMICAL CELLS

Klaus J. Bachmann, Piscataway, N.J.; Hans-Joachim Lewerenz, Berlin, Fed. Rep. of Germany, and Maria T. A. S. Menezes, Tewksbury, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 13, 1981, Ser. No. 234,418

Int. Cl.³ H01M *6/36*

U.S. Cl. 429—111 **8 Claims**



1. A device comprising an electrolyte, a semiconductor electrode, and means for electrically contacting said electrolyte and said semiconductor electrode characterized in that a passivating layer is formed on said semiconductor electrode by a process comprising a cyclic electrolyte technique, wherein said passivating layer is continuous, and is sufficiently thin so that tunneling of electrons through said passivating layer is allowed, wherein the energy difference between the Fermi level and the majority carrier band of said semiconductor material is smaller than the energy difference at infinite separation between said majority carrier band and the redox level of said electrolyte, and whereby when light is absorbed in said semiconductor material electrical power is generated.

4,388,383

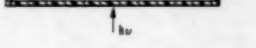
DEVICES HAVING CHEMICALLY MODIFIED P-TYPE INP SURFACES

Adam Heller, Bridgewater, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 14, 1981, Ser. No. 263,683

Int. Cl.³ H01M *6/36*; H01L *31/06*

U.S. Cl. 429—111 **9 Claims**



1. A semiconductor device comprising a p-type semiconductor selected from the group consisting of InP and InGaAsP, said semiconductor having a chemically treated surface further containing a metal selected from the group consisting of silver, ruthenium, gold, platinum and rhodium, said metal being present in an amount less than 1 monolayer.

4,388,384

PHOTOELECTROCHEMICAL CELL

R. David Rauh, Newton, and Robert A. Boudreau, Norton, both of Mass., assignors to EIC Laboratories, Inc., Newton, Mass.

Filed Jul. 6, 1981, Ser. No. 280,450

Int. Cl.³ H01M *6/36*

U.S. Cl. 429—111 **5 Claims**

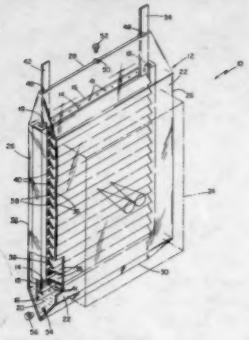
1. A photoelectrochemical cell comprising

a sealed container having a light-transmitting window for

admitting light into said container across a light-admitting plane,

an electrolyte in said container,

a photoelectrode in said container having a light-absorbing surface arranged to receive light from said window and in contact with said electrolyte, said surface having a plurality of spaced portions oblique to said plane, each said portion having dimensions at least an order of magnitude



larger than the maximum wavelength of incident sunlight, the total surface area of said surface being larger than the area of said plane bounded by said container, and

a counter electrode in said container in contact with said electrolyte,

said photoelectode being between said window and said counter electrode, having ion-flow openings therethrough, and being louvered to provide said portions and said openings.

4,388,385

SOLID ELECTROLYTE PHOTOCELL

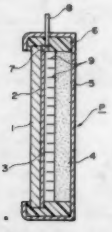
Satoshi Sekido, Yawata, and Tadashi Sotomura, Kashiwara, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Aug. 18, 1981, Ser. No. 294,017

Claims priority, application Japan, Aug. 19, 1980, 55-114593; Feb. 20, 1981, 56-24435

Int. Cl.³ H01M *6/36*

U.S. Cl. 429—111 **17 Claims**



1. A photocell comprising a solid electrolyte film made of a member selected from the group consisting of AgBr, AgI and salts containing a silver halide represented by AgX wherein X is Br or I, an optically transparent first electrode formed on one surface of the solid electrolyte film, and a second electrode formed on the other surface of said electrolyte film and made of a material capable of forming a charge transfer complex with the halogen of the electrolyte whereby, when light is irradiated on the electrolyte film through the first electrode, silver halide in said electrolyte film is photodissociated and an electrochemical discharge reaction is undergone between the silver formed on the first electrode and the complex formed in the second electrode by absorption of the halogen formed by the photodissociation.

4,388,386

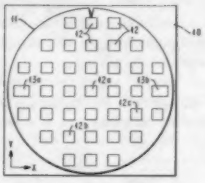
MASK SET MISMATCH

Bruce D. King, Burlington, and James P. Levin, Shelburne, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,591

Int. Cl.³ G03C *5/06*

U.S. Cl. 430—5 **10 Claims**



1. In a mask set comprised of a plurality of separate masks for producing integrated circuits, where each separate mask contains a plurality of similarly positioned images, a method of minimizing mismatch between the similarly positioned images provided on each mask in the set when the masks are assembled in a set and used to produce the circuits, comprising the steps of;

forming a first mask,

aligning said first mask to a fixed known standard,

determining the coordinates of the centroid of all image fields on said first mask,

forming a second mask,

aligning said second mask to said fixed known standard,

determining the coordinates of the centroid of all fields on said second mask, and

marking said second mask with respect to said first mask so that said second mask may be aligned with said first mask to cause the determined centroid of the second mask to overlie the determined centroid of the first mask to minimize the mismatch between the similarly positioned image fields on said first and said second masks and reduce the overall average error of the said similarly positioned image fields to zero.

4,388,387

PROCESS FOR FORMING COLOR IMAGES

Masayoshi Tsuboi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 26, 1980, Ser. No. 133,998

Claims priority, application Japan, Mar. 26, 1979, 55-35220

Int. Cl.³ G03F *5/00*

U.S. Cl. 430—7 **9 Claims**

1. A process for forming color micro patterns having high resolving power which comprises forming only a light absorbing dye layer or a light absorbing dye-containing layer directly on a base, at least the surface of which is composed of a transparent dye accepting polymer through which dyes are capable of thermally diffusing, imagewise exposing said dye layer or said dye-containing layer to light having a high energy density such that a dye image is formed in said dye accepting polymer of said base corresponding to the exposed area by thermal diffusion of the dye into the dye accepting polymer of said base, and thereafter removing by dissolving the dye or the dye-containing layer in the unexposed areas.

4,388,388

METHOD OF FORMING METALLIC PATTERNS ON CURVED SURFACES

Thomas W. Kornbau, Poway, and Robert A. Sievers, Escondido, both of Calif., assignors to General Dynamics Electronics Division, San Diego, Calif.

Filed Jun. 4, 1981, Ser. No. 270,338
Int. Cl.³ G03C 5/00; H01Q 1/28, 1/40
U.S. Cl. 430—258 7 Claims

1. The method of providing an electrical pattern on an element with a curved surface of dielectric material comprising the steps of;

coating said surface with a metal;

coating said metal with a photoresist;

forming a pattern in the emulsion of a stripping film that includes an emulsion on a thin membrane of flexible material having a thickness on the order of about one-half thousandth inch;

applying a thin layer of water soluble adhesive on said photoresist, said adhesive being non degradable to a subsequent process of exposing and developing the photoresist and etching away portions of said metal;

pressing said membrane against said adhesive in close engagement with the surface to conform said membrane to said curved surface;

exposing said membrane to a source of ultraviolet light to fix the pattern on said photoresist;

removing said membrane from said curved surface; and developing said photoresist and etching away that portion of the conductive surface that has not been fixed with said photoresist;

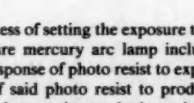
said method providing a sharp, clearly defined pattern in said curved surface.

4,388,389

PHOTO RESIST SPECTRAL MATCHING TECHNIQUE

Nathan Gold, 13126 Anza Dr., Saratoga, Calif. 95070

Filed Nov. 16, 1981, Ser. No. 321,656
Int. Cl.³ G03C 5/04; G01N 21/00
U.S. Cl. 430—30 12 Claims



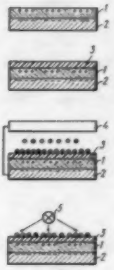
12. In the process of setting the exposure time of photo resist to a high pressure mercury arc lamp including the steps of measuring the response of photo resist to exposures; setting the exposure time of said photo resist to produce an image and developing the photo resist to obtain an image the improvement in said measuring the light intensity of the exposure source on said photo resist of utilizing discrete frequency bands from said high pressure mercury arc lamp to expose at the focus of said mercury arc lamp said photo resist; varying at a constant rate for each band the exposure on said photo resist to generate exposure lines; measuring the exposure lines to determine their ratio of exposure one to another; placing a light meter at the focus of the apparatus; and for each discrete frequency calibrating said light meter to emit a signal in a weighted average proportional to said ratios; placing said light meter at the focus of said light source whereby said light meter receives light intensity in the same manner as said photo resist is exposed.

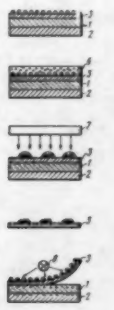
4,388,390

ELECTROPHOTOGRAPHIC METHOD FOR PRODUCING AN IMAGE ON DIELECTRIC FILM USING ION GENERATION

Felix A. Anokhin, ulitsa Argunovskaya, 8, kv. 222, Moscow, U.S.S.R.

PCT No. PCT/SU80/00097, § 371 Date Jan. 26, 1982, § 102(e) Date Jan. 26, 1982, PCT Pub. No. WO81/03556, PCT Pub. Date Dec. 10, 1981
PCT Filed May 30, 1980, Ser. No. 354,091
Int. Cl.³ G03G 13/18
U.S. Cl. 430—48 5 Claims





1. An electrophotographic method for producing an image on a dielectric film, in which the dielectric film is contacted with the surface of a charged and exposed electrophotographic layer, the latent image on the film is developed and fixed, characterized in that after the dielectic film (3) is contacted with the electrophotographic layer, the dielectric film (3) is acted on by positive and negative ions of the same concentration from a source (4) of ions which settle on the film (3) and produce a latent image thereon; before the development of this latent image the electrophotographic layer is illuminated by an actinic light source (5).

4,388,391

PROCESS FOR THE MANUFACTURE OF A LITHOGRAPHIC PRINTING FORM BY ELECTROPHOTOGRAPHY

Loni Schell, Hofheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 9, 1981, Ser. No. 232,888

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005695

Int. Cl.³ G03G *13/26, 13/32*

U.S. Cl. 430—49 11 Claims

1. A process for the manufacture of a lithographic printing form by electrophotographic means, comprising the steps of:

uniformly charging an oleophilic photoconductive layer which is present on an electrically conductive hydrophilic layer support and which contains a photoconductor and a binder;

image-wise exposing the charged photoconductive layer to produce a charge image;

developing the charge image with toner to produce a toner image comprised of imaged areas and non-image areas;

fixing the toner image;

decoating the non-image areas of the photoconductive layer to bare the electrically conductive layer support;

coating the bared areas of the layer support with a solution comprising a water-soluble, but hydrocarbon-insoluble film-forming polymer and a vinyl phosphonic acid compound;

drying the coating solution to form a uniform coating; and

removing the toner image by rinsing with a hydrocarbon composition containing aromatic portions in an amount of at least about 20% by weight, whereby said coating containing said vinyl phosphonic acid compound prevents deposition in non-imaged background areas of toner image substances which would cause toning of said printing form.

4,388,392

LAMINATED PHOTOSENSITIVE PLATE FOR ELECTROPHOTOGRAPHY HAVING AN ELECTRON DONATIVE POLYMER AND PHENANTHRENE CHARGE TRANSPORT LAYER

Yoshiaki Kato, Hirakata, and Akira Fushida, Suita, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Apr. 8, 1981, Ser. No. 252,261

Claims priority, application Japan, Apr. 11, 1980, 55/46768

Int. Cl.³ G03G *5/07, 5/14*

U.S. Cl. 430—58 12 Claims

1. A laminated photosensitive plate for electrophotography, which comprises a conductive substrate, a charge generating layer containing a photoconductive organic pigment, which is formed on the surface of the substrate, and a charge transporting layer formed on the charge generating layer, wherein the charge transporting layer is formed of a homogeneous composition comprising an electron-donative polymer photoconductor and phenanthrene incorporated in the polymeric photoconductor in an amount of 0.05 to 3 parts by weight per part by weight of the polymeric photoconductor.

4,388,393

HYDRAZONE COMPOUND, WITH HYDROXYETHYL GROUP IN CHARGE TRANSFER LAYER

Kiyoshi Sakai, Numazu, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

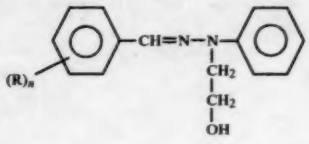
Filed Mar. 3, 1981, Ser. No. 239,954

Claims priority, application Japan, Mar. 13, 1980, 55-32420; Apr. 8, 1980, 55-46019

Int. Cl.³ G03G *5/14*

U.S. Cl. 430—59 12 Claims

1. An electrophotographic element comprising an electrically conductive substrate, a charge carrier generating layer and a charge transfer layer, wherein said charge transfer layer contains at least one hydrazone compound having the formula:



wherein R is hydrogen, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, dialkylamino group in which each alkyl has 1 to 6 carbon atoms or dibenzylamino, and n is an integer of 1 to 3; and a binder.

4,388,394

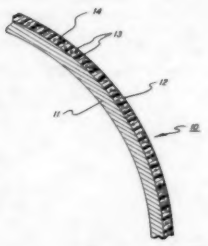
CADMIUM SULFIDE PHOTOCONDUCTOR BLENDED WITH LIGHT-ABSORBING MATERIAL

Sixdeniel Faria, and Ronald E. Karam, both of Towanda, Pa., assignors to Gte Products Corporation, Stamford, Conn.

Filed Jul. 13, 1981, Ser. No. 282,785

Int. Cl.³ G03G *5/04*

U.S. Cl. 430—94 5 Claims



1. A photoreceptor device comprising a conductive substrate and an electrophotographic layer thereon, the electrophotographic layer comprising particles of copper-chlorine activated cadmium sulfide photoconductor dispersed in a resin binder matrix, a light-absorbing material also being dispersed in said resin binder matrix, the amount of light-absorbing material being sufficient to significantly reduce the photodischarge rate of the electrophotographic layer.

4,388,395

LIQUID DEVELOPER FOR USE IN ELECTROPHOTOGRAPHY

Kazuo Tsubuko; Junichiro Hashimoto; Shinichi Kuramoto, all of Numazu, and Makoto Okawara, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,544

Claims priority, application Japan, Jan. 21, 1981, 56/7385

Int. Cl.³ G03G *9/12*

U.S. Cl. 430—114 7 Claims

1. A liquid developer for use in electrophotography which is prepared by dispersing a toner consisting essentially of a pigment or dye and a resin in a carrier liquid having a high insulating property and a low dielectric constant, wherein said resin is a nonaqueous dispersed resin obtained by effecting, in a nonaqueous solvent comprising an aliphatic hydrocarbon, the steps of:

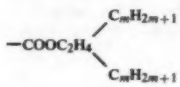
(a) copolymerizing (1) a monomer A having the general formula I:

wherein R is —H or —CH_3, A is —$COOC_nH_{2n+1}$ or —OC_nH_{2n+1}, and n is an integer of 6 to 20, with (2) a polyfunctional second monomer having two or more double bonds and (3) a third monomer selected from the group consisting of a monomer B having a glycidyl group or a vinyl monomer C having a carboxyl group,

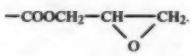
(b) esterifying the resulting copolymer with a fourth monomer selected from the group consisting of said monomer B and said monomer C, such that said fourth monomer is said monomer C when said third monomer is monomer B and said fourth monomer is said monomer B when said third monomer is monomer C, and

(c) grafting the resulting esterified copolymer with a monomer D selected from the group consisting of styrene, vinyl acetate, vinyltoluene, chlorostyrene, vinylpyrrolidone, vinylpyridine, and compounds having the general formula II:

wherein R is the same as defined above and Z is —$COOC_mH_{2m+1}$, wherein m is an integer of 1 to 4, —$OCOC_{m'}H_{2m'+1}$, wherein m' is an integer of 1 to 6,



wherein m is the same as defined above, —COOH, —$COOC_2H_4OH$ or



4,388,396

ELECTROPHOTOGRAPHIC PROCESS OF DEVELOPING AND TRANSFERING IMAGES USES FLUORINE CONTAINING OFFSET PREVENTING AGENT IN DEVELOPER

Hatsumi Nishibayashi, Hirakata; Yoshimi Amagai, Katano; Norio Hikake, Kyoto; Toshihiro Kouchi, Hirakata, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Division of Ser. No. 893,338, Apr. 4, 1978. This application Apr. 15, 1982, Ser. No. 368,728

Claims priority, application Japan, Apr. 7, 1977, 52-39015

Int. Cl.³ G03G *13/06, 13/14*

U.S. Cl. 430—126 **22 Claims**

1. A process for developing and fixing an electrostatic image comprising

developing the electrostatic image by contacting the electrostatic image with a developer consisting essentially of particles comprising a pigment, a binder and an offset-preventing agent selected from the group consisting of aliphatic fluorocarbon compounds and fluorochlorocarbon compounds to allow the developer to adhere to said electrostatic image,

transferring the image formed by said developer to a transfer sheet, and

fixing the transferred developer image onto said transfer sheet by contacting the transfer sheet while carrying said developer image with a heated polytetrafluoroethylene surface.

4,388,397

PHOTOSENSITIVE COMPOSITION FOR DRY DEVELOPMENT

Wataru Kanai, Samukawa, Japan, assignor to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 27, 1981, Ser. No. 248,325

Claims priority, application Japan, Mar. 29, 1980, 55-39673

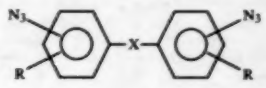
Int. Cl.³ G03C *1/71, 1/70, 1/60*

U.S. Cl. 430—197 **8 Claims**

1. In a photosensitive composition for dry development comprising a polymer and a subliming bisazide compound as a photocuring agent, the improvement comprising:

(a) selecting as the polymer, polyglycidyl methacrylate, and

(b) selecting the subliming bisazide compound from subliming bisazide compounds of the formula:



where R is a hydrogen or a halogen atom and X is an oxygen atom, a carbonyl group, a methylene group, a sulfur atom, a disulfide group or a sulfone group.

4,388,398

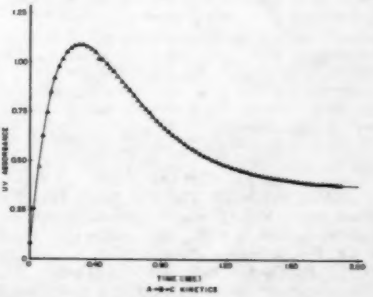
PHOTOGRAPHIC PRODUCTS AND PROCESSES WITH SILVER HALIDE SOLVENT PRECURSORS

Alan L. Borror, Lexington, and Ernest W. Ellis, Carlisle, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

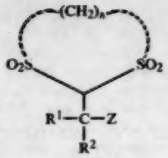
Filed Mar. 23, 1982, Ser. No. 360,822

Int. Cl.³ G03C *5/54, 5/38, 1/48*

U.S. Cl. 430—212 **27 Claims**



11. A photographic product which comprises a first sheet-like element comprising a photosensitive silver halide emulsion layer carried on a support, a second sheet-like element adapted to be superposed with said first sheet-like element, means for retaining an aqueous alkaline processing composition for distribution between said first and second sheet-like elements, and a silver halide solvent precursor disposed in one or both of said sheet-like elements, said silver halide solvent precursor being a compound selected from those represented by the formula



wherein R^1 is a monovalent organic radical; R^2 is hydrogen or a monovalent organic radical; Z is a moiety that undergoes β-elimination in aqueous alkaline solution; and n is an integer 3, 4 or 5.

12. A photographic product as defined in claim 11 wherein said silver halide solvent precursor is disposed in said first sheet-like element.

15. A photographic product as defined in claim 12 wherein one of said first and second sheet-like elements additionally includes an image-receiving layer.

16. A photographic product as defined in claim 15 wherein said image-receiving layer is contained in said second sheet-like element.

18. A photographic product as defined in claim 16 wherein said image-receiving layer is a dye image-receiving layer and said first sheet-like element additionally includes a dye image-forming material associated with said silver halide emulsion layer.

4,388,399

LIGHT-SENSITIVE IMAGE-FORMING MATERIAL

Fumiaki Shinozaki; Tomizo Namiki, both of Asaka, and Tomoaki Ikeda, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 181,558, Aug. 27, 1980, abandoned. This application Feb. 10, 1982, Ser. No. 347,620

Claims priority, application Japan, Aug. 28, 1979, 54-109417

Int. Cl.³ G03C 1/76

U.S. Cl. 430—271 **6 Claims**

1. A light-sensitive image-forming material which comprises a support having provided thereon a first layer consisting essentially of at least one alcohol-soluble polyamide resin and, on said first layer, a second layer comprising a light-sensitive photoresist composition, said layer containing said alcohol-soluble polyamide resin and further consisting essentially of one or more polymers having one or more of a free carboxy group(s), one or more of a phenolic hydroxy group(s) or a maleic anhydride group in a proportion of about 0.1:9.9 to 6:4 by weight to said polyamide resin, wherein said light-sensitive layer and said alcohol-soluble polyamide resin layer are capable of being simultaneously developed and etched in an alkaline aqueous developer, whereby only either unexposed or exposed areas are selectively dissolved or swollen by the aqueous developing solution and removed.

4,388,400

HEAT-MODE RECORDING MATERIAL

Masatoshi Tabei; Minoru Wada; Yonosuke Takahashi, and Satoshi Yoshida, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 6, 1981, Ser. No. 309,143

Claims priority, application Japan, Oct. 6, 1980, 55-139687

Int. Cl.³ G03C 1/76, 5/04

U.S. Cl. 430—346 **23 Claims**

1. A heat-mode recording material for recording information by imagewise exposure to high intensity radiation, which comprises a base support having thereon a recording layer capable of thermal deformation at the irradiated areas to cause a difference in optical density between the irradiated areas and the non-irradiated areas, said recording layer being a hydrogen-containing layer comprised of one or more elemental metals selected from the group consisting of Mg, Sc, Y, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Re, Fe, Co, Ni, Ru, Rh, Pd, Ir, Pt, Cu, Ag, Au, Zn, Cd, Al, Ga, In, Si, Ge, Tl, Pb, Po, Sn, As, Sb, Bi, Se and Te, wherein the hydrogen is introduced in the elemental metal layer to increase heat-sensitivity of the elemental metal layer.

4,388,401

MULTILAYER COLOR REVERSAL LIGHT-SENSITIVE MATERIAL

Kazunori Hasebe, and Yoshisato Minagawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 29, 1981, Ser. No. 335,412

Claims priority, application Japan, Dec. 29, 1980, 55/185668

Int. Cl.³ G03C 1/76

U.S. Cl. 430—505 **9 Claims**

1. A multilayer color reversal light-sensitive material comprising a support, a yellow filter layer, a group of green-sensitive emulsion layers, and a group of red-sensitive emulsion layers, wherein

said emulsion layer groups are positioned nearer to the support than the yellow filter layer,

each of the emulsion layer groups comprises at least two adjacent layers, including a high-sensitivity silver halide emulsion layer containing a coupler and silver halide grains having an average size of from 0.6μ to 2.0μ, and a low-sensitivity silver halide emulsion layer containing a coupler and silver halide grains having an average size of from 0.1μ to 0.5μ, and

at least one of the green-sensitive low-sensitivity emulsion layer or the red-sensitive low-sensitivity emulsion layer is positioned farther from the support than the high-sensitivity emulsion layer of the corresponding emulsion layer group.

4,388,402

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yasuo Mukunoki, Minami-ashigara; Yasuhiro Nakayama, Fujinomiya, and Shigeki Yokoyama, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

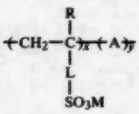
Filed Aug. 12, 1981, Ser. No. 292,082

Claims priority, application Japan, Aug. 15, 1980, 55-112416

Int. Cl.³ G03C 1/06, 1/38, 1/84

U.S. Cl. 430—527 **19 Claims**

1. A photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer, said material including at least one hydrophilic colloid layer containing at least 0.1 g/m² of a water-soluble polymer having a molecular weight of from 10,000 to 500,000 and consisting essentially of a repeating unit represented by formula (I)



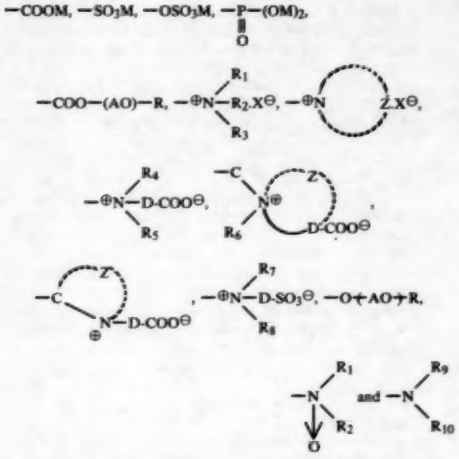
(I)

wherein R represents a hydrogen atom, a halogen atom, or an alkyl group; L represents an arylene group, an arylenealkylene group, an alkylene group or a single chemical bond; M represents a hydrogen atom, an ammonium ion, or an alkali metal ion; x represents from 10 to 100 mol%; y represents from 0 to 90 mol%; and A represents a copolymerized monomer unit selected from an ethylenically unsaturated monocarboxylic acid or dicarboxylic acid, an ester of an ethylenically unsaturated monocarboxylic acid or dicarboxylic acid, an ethylenically unsaturated ester of a monoaliphatic acid, styrene, α-methylstyrene, acrylonitrile, acrylamide, methacrylamide, N-vinyl pyrrolidone, ethylene, propylene, or a diene, wherein

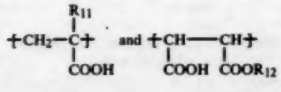
said photographic material further contains an organic fluoro-compound represented by formula (II)

$$(Cf)(Y)_n \quad \text{(II)}$$

wherein (Cf) represents an n-valent group containing at least three fluorine atoms and at least three carbon atoms; n represents an integer of 1 or 2; and (Y) represents a moiety selected from the group consisting of



wherein M represents a hydrogen atom, a cation or a hydrocarbon group having from 1 to 18 carbon atoms; —(AO)— represents a polyalkylene oxide group having a degree of polymerization of from 2 to 100 and selected from the group consisting of polyoxyethylene, polyoxypropylene and a polyoxyethylene-polyoxypropylene block copolymer; R represents a hydrogen, atom an alkyl group having from 1 to 18 carbon atoms or an aryl group; R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 each represents an alkyl group having from 1 to 4 carbon atoms or a hydroxyalkyl group having from 1 to 4 carbon atoms; R_9 and R_{10} each represents a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms or a hydroxyalkyl group having from 1 to 4 carbon atoms; X represents a halogen atom or an R—O—SO_2—$O^{\ominus}$ group; Z represents an atom or an atomic group forming a 5-membered or 6-membered ring together with the N atom; and D represents an alkylene group having 1 to 5 carbon atoms and a film forming water soluble polymer having carboxylic acid groups selected from



wherein R_{11} represents a hydrogen atom cr a methyl group; and R_{12} represents a hydrogen atom or an alkyl group having from 1 to 5 carbon atoms.

4,388,403

PROCESS FOR THE PREPARATION OF DISPERSIONS OF HYDROPHOBIC SUBSTANCES IN WATER

Günter Helling, Odenthal; Helmut Reiff; Wolfgang Himmelmann, both of Leverkusen, and Günter Renner, Gladbach, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 24, 1981, Ser. No. 305,201

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, 3036846

Int. Cl.³ G03C *1/40*

U.S. Cl. 430—546 **7 Claims**

6. The method of preparing color photographic materials which comprises the steps of preparing a solution of a hydrophobic substance together with an ionomeric polyaddition or condensation product in an organic, water-miscible solvent having a boiling point below 120° C., or in a mixture of the organic solvent with water in a proportion by weight of from 50:50 to 100:0, water being added to the solution so that the proportion, by weight, of solvent to water in the mixture is from 10:1 to 1:10, and then removing the organic solvent from the solution.

4,388,404

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masakazu Morigaki; Morio Yagihara, and Takashi Ozawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

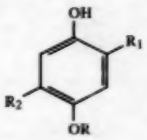
Filed Apr. 19, 1982, Ser. No. 369,769

Claims priority, application Japan, Apr. 21, 1981, 56-60264

Int. Cl.³ G03C *1/40*

U.S. Cl. 430—548 **25 Claims**

1. A silver halide color photographic light-sensitive material, comprising: a magenta color image forming polymer coupler latex; and a compound represented by the following general formula (I)



(I)

wherein R represents an alkyl group; and R_1 and R_2 each represents a tertiary alkyl group and R_1 and R_2 may be the same or different.

4,388,405

METHOD FOR PRODUCING L-HISTIDINE BY FERMENTATION

Kounosuke Sano, Tokyo, and Takayasu Tsuchida, Kawasaki, both of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Jun. 12, 1980, Ser. No. 158,876

Claims priority, application Japan, Jun. 25, 1979, 54-79851

Int. Cl.³ C12N *1/20, 15/00*; C12P *13/24*; C12R *1/185*

U.S. Cl. 435—107 **10 Claims**

1. A method for producing L-histidine by fermentation which comprises: culturing in a culture medium an L-histidine producing microorganism selected from the group consisting of *Escherichi coli* NRRL B-12116, *Escherichia coli* NRRL B-12118, *Escherichia coli* NRRL B-12119, *Escherichia coli* NRRL B-12120 and *Escherichia coli* NRRL B-12121, which is produced by incorporating a hybrid plasmid into a recipient strain of the genus "Escherichia", said hybrid plasmid containing a deoxy-ribonucleic acid fragment possessing genetic information related to L-histadine production, obtained from a mutant of the genus "Escherichia", resistant to a histidine analogue;

and recovering the L-histidine accumulated in the culture medium.

4,388,406

PROCESS FOR ISOLATING CU,ZN-SUPEROXIDE DISMUTASE FROM AQUEOUS SOLUTIONS CONTAINING SAID ENZYME TOGETHER WITH ACCOMPANYING PROTEINS

Jack T. Johansen, Rungsted Kyst, Denmark, assignor to De Forenede Bryggerier A/S, Copenhagen, Denmark

Continuation of Ser. No. 149,383, May 13, 1980, abandoned. This application Oct. 27, 1981, Ser. No. 315,392

Claims priority, application Denmark, May 17, 1979, 2033/79; Apr. 21, 1980, 1687/80

Int. Cl.³ C12N *9/02, 9/08*

U.S. Cl. 435—189 **2 Claims**

1. A process for isolating Cu,Zn-superoxide dismutase (SOD) from aqueous solutions containing said enzyme together with accompanying proteins, characterized by subjecting the solution at a pH of 4.7 to 5.5 to chromatography on a cation exchange resin of the same polarity as SOD in the pH range used.

4,388,407

PROCESS AND APPARATUS FOR THE RAPID DETERMINATION OF THE CHARACTERISTICS OF A PETROLEUM POLLUTANT

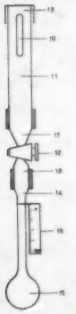
Andre Lepain, Rosiere; Robert Bronchart, Brussels, and Roger Remacle, Lasne, all of Belgium, assignors to Labofina, S.A., Brussels, Belgium

Filed Feb. 2, 1981, Ser. No. 230,637

Claims priority, application Belgium, Jun. 12, 1980, 201011

Int. Cl.³ G01N *9/04, 25/10, 33/28*

U.S. Cl. 436—3 **4 Claims**



1. A process for determining the characteristics of an oil-pollutant containing water which comprises the steps of:

(a) determining the water content of the mixture of water and pollutant by

introducing into the upper part of a first glass tube having a valve separating the upper and lower parts thereof, a cup filled with a known volume of said mixture of water and pollutant, an amount of a solvent for oil sufficient to completely solubilize all of the pollutant from said mixture, said solvent being substantially water-insoluble and having a specific gravity significantly higher than that of water, and a water-repellent coalescent agent,

closing the top of said first tube and agitating the contents of said first tube until the pollutant from said mixture is completely solubilized in said solvent,

opening the valve separating the upper and lower parts of the first tube and allowing the mixture to decant into an upper aqueous phase and a lower organic phase in the lower part of said first tube,

placing the zero of a graduated plate which is movable along the lower part of said first tube in front of the upper meniscus of said aqueous phase, said graduated plate being previously calibrated in percent water, and

noting the graduation of said movable plate which is in front of the lower meniscus of said aqueous phase and which indicates the water content of the mixture of water and pollutant;

(b) determining the specific gravity of said mixture of water and pollutant by

hanging a vessel of known volume filled with the mixture of water and pollutant and closed with a cap on a calibrated spring which is provided with an indicator mark and enclosed in a suspended second glass tube, said vessel being hung on said spring via an attachment rod which connects the calibrated spring with the cap of the vessel, and

noting the graduation on a fixed graduation plate previously standardized in specific gravity and attached to the second glass tube, which is in front of the indicator mark of the calibrated spring;

(c) determining the initial boiling point of the pollutant by

introducing into a third glass tube having closing means at the top thereof, filter means near the bottom thereof, and a valve at the bottom thereof beneath said filter means, a sample of the mixture of water and pollutant, and an amount of a glycol-type solvent sufficient to separate the water from the mixture of water and pollutant, said glycol-type solvent being water-soluble and practically insoluble in the pollutant,

allowing the mixture to decant into a lower aqueous phase and an upper organic phase,

opening the valve at the bottom of said third tube and allowing the aqueous phase to run out of the third tube,

thereafter introducing into the organic phase remaining in said third glass tube an amount of a mixture of anhydrous calcium chloride and anhydrous sodium sulfate sufficient to absorb any water remaining in said organic phase,

reopening the valve at the bottom of said third tube and collecting the water-free pollutant, said calcium chloride and sodium sulfate being retained in said third tube by said filter means,

introducing the resulting water-free pollutant into a device formed by a fourth glass tube comprising a first inclined lateral tube having a thermometer mounted therein and a second lateral tube diametrically opposed to said first lateral tube comprising two horizontal branches linked by a vertical branch topped by a vent tube, said second lateral tube ensuring reflux of distilled pollutant in said fourth glass tube through the two horizontal branches, the lower horizontal branch extending into the interior of said fourth glass tube to promote the formation of a liquid plug whereby exhaust of vapors directly through the second lateral tube is avoided,

securing said device above the burner of a gas-fired torch and heating the water-free pollutant in said fourth glass tube until reflux occurs, and

noting the temperature indicated on the thermometer at the time reflux occurs.

4,388,408

COKER FEEDSTOCK ANALYSIS METHOD

Herbert P. Sien, Philadelphia, Pa., and Thomas J. McGinley, Wilmington, Del., assignors to Suntech, Inc., Philadelphia, Pa.

Filed Dec. 22, 1980, Ser. No. 219,406

Int. Cl.³ G01N *33/26*

U.S. Cl. 436—60 **3 Claims**

1. A method for determining the suitability of a clarified slurry oil from a fluidized bed catalytic cracking operation as a feedstock for electrode grade coke which comprises subjecting said feedstock to analysis of asphaltenes and U.V. absorptivity

and selecting as suitable for coking those oils which show no more than 12 weight percent of asphaltenes and a minimum absorptivity in a 1 cm. cell of 40 , 19 and 15 liters per gm-cm., at wave lengths of 292, 324 and 340 nm., respectively.

4,388,409

CEMENT TEST DEVICE FOR THE DETECTION OF IMITATION GOLD

Andre Reiss, 147-47 Village Rd., Jamaica, N.Y. 11435

Filed Jan. 7, 1982, Ser. No. 337,680
Int. Cl.³ G01N *21/78, 33/20*
U.S. Cl. 436—80 **7 Claims**

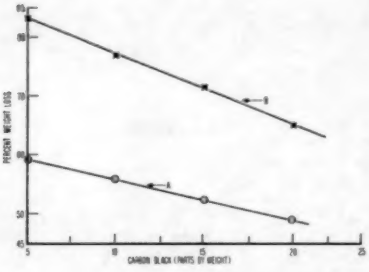
1. A test device for the detection of imitation gold or the purity of gold alloy comprising a cast cement carrier impregnated with an aqueous acidic solution of a complex molybdic acid and a hygroscopic salt.

4,388,410

METHOD TO DETERMINE CARBON BLACK CONTENT

Nestor A. Arroyo, Cranbury; Nitin V. Desai, Hightstown, both of N.J., and James F. Buchanan, Greenwood, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 9, 1981, Ser. No. 223,856
Int. Cl.³ G01N *25/00, 33/44*
U.S. Cl. 436—85 **9 Claims**



1. A method for thermogravimetrically analyzing a plastic molding composition comprising carbon black and a molding resin consisting of a homopolymer or copolymer of vinyl chloride determine the carbon black content wherein the method comprises the steps of:

(a) compounding the plastic molding composition so that the carbon black is uniformly dispersed therein,

(b) heating the molding composition in an inert atmosphere at about 350° C.,

(c) maintaining the molding composition at about 350° C. in an inert atmosphere for a first given time which is long enough so that there is no further significant weight loss,

(d) heating the molding composition in an inert atmosphere to a temperature between about 600° C. and 750° C.,

(e) maintaining the molding composition at a temperature between about 600° and 750° C. in an inert atmosphere for a second given time which is long enough so that there is no further significant weight loss,

(f) weighing the molding composition to determine the weight loss during the first given time and the second given time, and

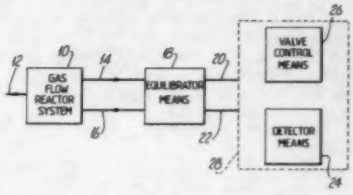
(g) comparing the weight loss with that for samples of known composition analyzed under the same conditions to determine the carbon black content of the molding composition.

4,388,411

APPARATUS AND METHOD FOR DETECTING FLUID

James E. Lovelock, Launceston, England, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 29, 1981, Ser. No. 258,843
Int. Cl.³ G01N *27/14, 21/72, 33/00*
U.S. Cl. 436—149 **28 Claims**



1. Apparatus for use in detecting a constituent fluid in very low concentrations in a sample flow of fluid, also containing at least one contaminant, the apparatus comprising first and second conduit means each having an inlet and an outlet and being formed of a material which is permeable to the at least one contaminant; enclosure means for enclosing the first and second conduit means substantially along the length thereof, the enclosure means having an inlet and an outlet whereby a diluent fluid can be passed through the enclosure means to remove contaminant diffused from the first and second conduit means into the enclosure means and whereby residual contaminant can be distributed equally between the first and second conduit means; detector means having a first inlet and an outlet; and valve control means for alternately allowing the sample flow of fluid from the first conduit means to pass through the detector means, when the valve control means is in a first condition, and a reference flow of fluid from the second conduit means to pass through the detector means, when the valve control means is in a second condition.

4,388,412

IMMUNOASSAY OF PHOSPHOLIPID, SUCH AS PHOSPHATIDYLCHOLINE, IN FLUIDS SUCH AS AMNIOTIC

Kenichi K. Yabusaki, Albany, Calif., assignor to Hana Biologics, Inc., Emeryville, Calif.

Filed Feb. 2, 1982, Ser. No. 344,930
Int. Cl.³ G01N *33/54, 33/92*
U.S. Cl. 436—536 **20 Claims**

1. A method of determining the presence of a phospholipid in a biological fluid comprising:

A. adding an ethanolic solution of diacylphosphatidylcholine and cholesterol to the biological fluid forming a macromolecular aggregate complex solution;

B. adding the macromolecular aggregate complex solution to antibody molecules to the phospholipid in an aqueous buffered medium causing an agglutination reaction; and

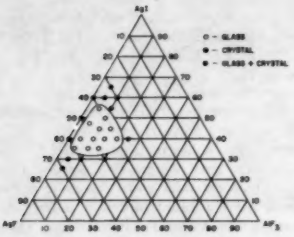
C. examining the results of the agglutination reaction to determine the presence of the phospholipid.

4,388,413

SILVER HALIDE GLASSES

Robert H. Doremus, 1544 Keyes Ave., Schenectady, N.Y. 12309; George Chanak, 167 Cold Spring Rd., Stamford, Conn. 06905; B. Michael Kale, 70 Olmstead La., and James E. Moore, 105 Keeler Dr., both of Ridgefield, Conn. 06877

Filed Oct. 21, 1981, Ser. No. 313,481
Int. Cl.³ C03C 3/12, 3/18, 3/24
U.S. Cl. 501—40 4 Claims



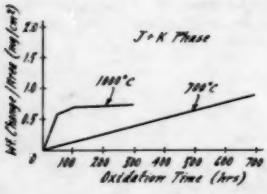
1. A glass composition comprising 35 to 64 percent silver fluoride, 30 to 60 percent silver iodide and aluminum fluoride wherein said aluminum fluoride is present in an amount up to 30 percent of said glass.

4,388,414

THERMALLY STABLE SILICON NITRIDE MATERIAL

John A. Mangels, Flat Rock, and John R. Baer, Ypsilanti, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1981, Ser. No. 332,918
Int. Cl.³ C04B 35/58
U.S. Cl. 501—98 1 Claim



1. A thermally stable material which consists of:
a substantially pure primary phase formed of substantially pure silicon nitride; and
a substantially pure secondary phase formed of a material selected from the group consisting of $Si_3N_4/SiO_2/4Y_2O_3$, $Si_3N_4/SiO_2/2Y_2O_3$, $Si_3N_4/4SiO_2/5Y_2O_3$, wherein said primary phase forms individual grains and said secondary phase forms grain boundaries between said individual grains.

4,388,415

HIGH VOLTAGE DIELECTRIC (SRT 103)

Mike S. Chu, State College, Pa., assignor to Erie Technological Products, Inc., Erie, Pa.

Filed Sep. 30, 1981, Ser. No. 306,960
Int. Cl.³ C04B 35/00
U.S. Cl. 501—136 7 Claims

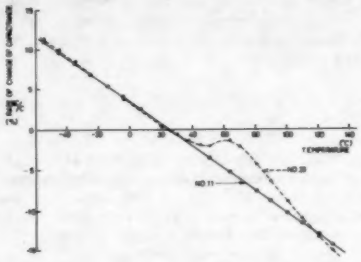
1. A ceramic dielectric composition consisting essentially of 63 to 74 mole % of $SrTiO_3$, 17 to 25 mole % TiO_2, and 9 to 12 mole % Bi_2O_3 and further including 1 to 8 weight % NiO based on the total weight of the above mentioned three compounds $SrTiO_3$, TiO_2, and Bi_2O_3, the ceramic composition has high dielectric constant, low dielectric loss at 1 KHz, 1 MHz, and 60 Hz, small variation of capacitance with temperature from −55° C. to +125° C., high insulation resistance, and high dielectric breakdown voltage.

4,388,416

CERAMIC DIELECTRIC COMPOSITIONS FOR TEMPERATURE COMPENSATING CAPACITORS

Yukio Sakabe, and Yukio Hamaji, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Nov. 6, 1981, Ser. No. 318,863
Claims priority, application Japan, Nov. 28, 1980, 55-168870
Int. Cl.³ C04B 35/46
U.S. Cl. 501—136 1 Claim



1. Ceramic dielectric compositions for temperature compensating capacitors, which have a high dielectric constant of 350 to 500, a small temperature coefficient of dielectric constant of N 1200–N 2000 ppm/°C. and a good linearity of temperature coefficient, a Q value of 1000 or more and consisting essentially of:
strontium oxide (SrO);
calcium oxide (CaO);
titanium dioxide (TiO_2);
bismuth oxide (Bi_2O_3);
trilead tetroxide (Pb_3O_4); and
magnesium oxide (MgO);
wherein the percentages by weight of said composition fall within the region of 1.2–19.0% by weight of SrO, 12.2–17.4% by weight of CaO, 35.8–43.9% by weight of TiO_2, 15.7–37.6% by weight of Bi_2O_3, 1.9–14.6% by weight of Pb_3O_4, and 0.9–2.7% by weight of MgO.

4,388,417

REGENERATION OF DEEP BED CONDENSATE POLISHERS

Peter E. Down, Summit, and Eli Salem, Deal, both of N.J., assignors to Ecodyne Corporation, Chicago, Ill.

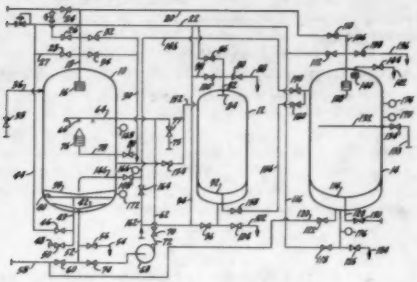
Filed Oct. 26, 1981, Ser. No. 315,252
Int. Cl.³ B01J 49/00
U.S. Cl. 521—26 4 Claims

1. A method for regenerating a mixture of anion and cation exchange resins from a mixed bed demineralizer, comprising:
transferring the exhausted anion and cation resins into a separation vessel having a quantity of inert material therein whose specific density is intermediate to the specific densities of the anion and cation resins;
passing a backwash liquid through the separation vessel so as to separate the resins into an upper anion resin layer, an intermediate inert material layer and a lower cation resin layer;
transferring the cation resin from the bottom of the separation vessel to a cation regeneration vessel, leaving the anion resin and substantially all of the inert material in the separation vessel;
passing a regenerant liquid through the separation vessel to regenerate and float the anion resin;
transferring the floating anion resin from the separation

vessel to an anion rinse vessel, leaving the inert material and any not previously transferred cation resin in the separation vessel;

rinsing the anion resin within the anion rinse vessel;

passing a regenerant liquid through the cation regeneration vessel to regenerate the cation resins;



rinsing the cation resin within the cation regeneration vessel; and

transferring the anion resin from the anion rinse vessel to the cation regeneration vessel.

4,388,418

FOAMABLE POLYMERIC STYRENE PARTICLES

Richard A. Schwarz, Big Spring, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Filed Sep. 24, 1982, Ser. No. 423,487
Int. Cl.³ C08J *9/20*
U.S. Cl. 521—56 **6 Claims**

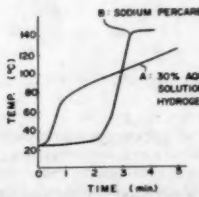
1. An expandable polymeric styrene particle having incorporated therein a blowing agent, from about 0.1% to about 0.5% by weight of bis (allyl ether) of tetrabromobisphenol A and from about 1% to about 2.5% by weight of dibromoethyldibromocyclohexane all percentages being based upon the weight of the polymeric styrene.

4,388,419

UNSATURATED POLYESTER RESIN FOAMS AND METHOD OF PREPARATION

Shinji Murakami, Kyoto, Japan, assignor to Eiwa Chemical Industry Co., Ltd., Kyoto, Japan

Filed Jan. 12, 1982, Ser. No. 339,009
Claims priority, application Japan, Jan. 19, 1981, 56-5113
Int. Cl.³ C08J *9/10*
U.S. Cl. 521—103 **10 Claims**



1. An foamable liquid unsaturated polyester resin composition which comprises in combination:

(a) a liquid unsaturated polyester resin in solution with an ethylenically unsaturated monomer,

(b) a hydrazide compound in an amount of from 0.1 to 20 phr,

(c) a cobalt compound in an amount of from 0.003 to 0.5 phr as a metal content, and

(d) at least one powdered inorganic compound selected from the group consisting of percarbonates, perborates and perphosphates in an amount of from 0.1 to 20 phr.

4,388,420

PROCESS FOR PREPARING A MICROCELLULAR POLYURETHANE FOAM WITH IMPROVED GREEN STRENGTH

Robert L. McBrayer, Lincoln Park, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 146,646, May 5, 1980, abandoned. This application Nov. 30, 1981, Ser. No. 325,793
Int. Cl.³ C08G *18/14, 18/18, 18/24*
U.S. Cl. 521—127 **6 Claims**

1. A process for preparing a flexible, microcellular polyurethane foam with improved green strength, comprising:

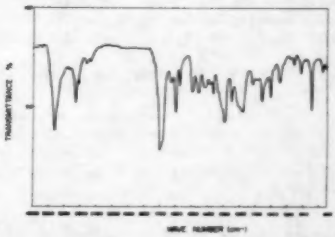
reacting together a polyalklyene polyether polyol having an average functionality of from about 2 to about 8 and an average equivalent weight of from about 1000 to about 2700, a chain extender and an organic polyisocyanate in the presence of an admixture of (1) a urethane—formation promoting organometallic catalyst and (2) an amine selected from the group consisting of N, N, N¹, N¹-tetrakis-(2-hydroxypropyl)ethylene diamine, triethanolamine and mixtures thereof, the amine being present in an amount ranging from about 0.1 to about ten parts by weight thereof per hundred parts by weight of polyol.

4,388,421

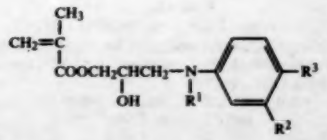
N-(2-HYDROXY-3-METHACRYLOYLOXYPROPYL)-AMINOBENZOIC ACID DERIVATIVES AND DENTAL ADHESIVE COMPOSITION CONTAINING SAME

Shin-ichi Suzuki, Odawara; Shinya Kitoh, Hiratsuka; Haruhiko Toda, Odawara, and Moriaki Higo, Ninomiya, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Dec. 14, 1981, Ser. No. 330,605
Claims priority, application Japan, Dec. 20, 1980, 55-181066; Dec. 20, 1980, 55-181067
Int. Cl.³ C08K *5/10, 5/16*
U.S. Cl. 523—118 **10 Claims**



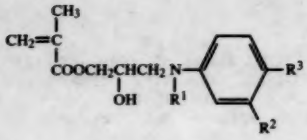
1. An N-(2-hydroxy-3-methacryloyloxypropyl)-aminobenzoic acid derivative having the general formula:



(I)

wherein R^2 is a carboxyl group and R^3 is a hydrogen atom when R^1 is a methyl group, and R^2 is a hydroxyl group and R^3 is a carboxyl group when R^1 is a hydrogen atom.

4. A dental adhesive composition comprising an N-(2-hydroxy-3-methacryloyloxypropyl)aminobenzoic acid derivative having the general formula:



(I)

wherein R^2 is a carboxyl group and R^3 is a hydrogen atom when R^1 is a methyl group, and R^2 is a hydroxyl group and R^3 is a carboxyl group when R^1 is a hydrogen atom.

4,388,422

FIBER-REINFORCED COMPOSITE MATERIALS

Steven R. Gerteisen, and David R. Wetzel, both of Evansville, Ind., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Apr. 16, 1979, Ser. No. 30,253

Int. Cl.³ C08L *69/00*; C08K *7/14, 9/02*

U.S. Cl. 523—137 **1 Claim**

1. A fiber reinforced thermoplastic resin composition of improved shielding effectiveness against electromagnetic interference comprising a polycarbonate resin having incorporated therein a commingled fiber constituent comprised of aluminized glass fibers and carbon fibers, wherein the fiber component and the resin component are present over a range of fiber to resin of from about 10% to about 45% and wherein the aluminized glass fiber and the carbon fiber are present over a range of aluminized glass fiber to carbon fiber of from about 20% to about 80%.

4,388,423

FRICTION LINING MATERIAL

Edward R. Kaufman, Andover; Gregory R. Benson, Dracut, and Alfred Shaines, Waban, all of Mass., assignors to Glennco Trust, Lawrence, Mass.

Continuation of Ser. No. 316,784, Nov. 2, 1981, which is a continuation-in-part of Ser. No. 98,996, Nov. 30, 1979, and Ser. No. 259,857, May 4, 1981. This application Jul. 29, 1982, Ser. No. 402,835

Int. Cl.³ C08J *5/14*

U.S. Cl. 523—153 **17 Claims**

1. A friction material for use as a brake lining and the like comprising expanded vermiculite having an average minimum particle size of about 0.15 mm. and a thermosetting resin, said vermiculite and thermosetting resin being present in the friction material in a weight ratio of resin-to-vermiculite in a range from about 1.5/1 to 0.15/1, having no more than 15% of fibrous material either alone or in combination with acicular mineral particles.

4,388,424

CAULK CONTAINING MICROBALLOONS

Samuel C. Kennell, Chesterland, and Ronald F. Witkiewicz, Garfield Hts., both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Nov. 5, 1981, Ser. No. 318,472

Int. Cl.³ C08J *9/32*

U.S. Cl. 523—219 **2 Claims**

1. A low shrink lightweight caulk for sealing structural joints containing binder, plasticizer, filler, adhesion promoter, and other caulk additives, wherein the improvement comprises:

40% to 75% by weight of an acrylic copolymer latex binder

25% to 60% by weight of glass microballoon powder having a predominant particle size less than about 130 microns.

4,388,425

PRODUCTION OF CONCENTRATES OF TITANIUM DIOXIDE IN POLYCAPROLACTAM

Hugo Strehler, Frankenthal; Werner Hoerauf, and Guenter Valentin, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,296

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1981, 3128476

Int. Cl.³ C08L *77/02*

U.S. Cl. 523—333 **2 Claims**

1. A process for the production of a concentrate of from 20 to 50% by weight of titanium dioxide in polycaprolactam, wherein a 5–15% strength by weight aqueous suspension of titanium dioxide is metered into a solution of caprolactam in water at from 110° to 150° C. at the same rate at which water is distilled off, and after all the water has been distilled off the resulting mixture is polymerized at from 240° to 280° C.

4,388,426

STABILIZATION OF EPOXY SYSTEMS IN NON-FLAMMABLE SOLVENTS

Ralph M. Schure, Darien, and Gerald H. Steele, Lisle, both of Ill., assignors to Eschem Inc., Chicago, Ill.

Filed Jun. 26, 1981, Ser. No. 277,903

Int. Cl.³ C08G *69/48, 59/18*; C08L *63/02*; C08K *5/02*

U.S. Cl. 523—462 **23 Claims**

1. A flame-resistant laminating adhesive composition comprising:

a part A component including an epoxy containing reactive resin and a flame-resistant solvent; and

a part B component including a polyamide reactive resin, a flame-resistant halogenated hydrocarbon solvent, and an adduct of an amine and an aromatic hydroxy compound or epoxy resin, said amine being a catalyst for said epoxy containing reactive resin, and said adduct being resistant to reaction of said amine with said halogenated hydrocarbon solvent.

4,388,427

HEAT-SET TYPE PRINTING INKS

Syuzi Nishikawa; Toru Matsubara; Kazuyoshi Iida, and Seiichiro Tahara, all of Kyobashi, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1981, Ser. No. 301,152

Claims priority, application Japan, Sep. 28, 1980, 55-130710

Int. Cl.³ C09D *11/06, 11/08*

U.S. Cl. 523—500 **5 Claims**

1. A heat-set type printing ink comprising as the vehicle a non-aqueous dispersion prepared by dissolving at least one member selected from the group consisting of petroleum resins, modified rosin resins and alkyd resins in a hydrocarbon solvent-containing solvent boiling at not lower than 170° C. to form a resin solution and polymerizing at least one kind of vinyl monomer in said resin solution to obtain the non-aqueous dispersion.

4,388,428

BIOLOGICALLY STABILIZED COMPOSITIONS COMPRISING COLLAGEN AS THE MAJOR COMPONENT WITH ETHYLENICALLY UNSATURATED COMPOUNDS USED AS CONTACT LENSES

Petr Kuzma, Dayton, and Giovanina Odorisio, Palisades Park, both of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,432

Int. Cl.³ C08H *1/00*

U.S. Cl. 523—106 **29 Claims**

1. A polymerized hydrophilic water-swellable, biologically stable composition made from a mixture of components consisting essentially of:

(a) solubilized collagen; and

(b) an ethylenically unsaturated monomer which is characterized by a polymerizable carbon-to-carbon double bond and is composed of atoms of the group consisting of

(i) carbon, hydrogen, oxygen and nitrogen in the form of amido and optionally oxygen in the form of carbonyl,

(ii) carbon, hydrogen, and oxygen in the form of carbonyloxy and hydroxyl, and optionally oxygen in the form of etheric oxygen,

(iii) carbon, hydrogen, carbonyloxy oxygen and etheric oxygen,

(iv) carbon, hydrogen, carbonyloxy oxygen, and oxygen in the form of vicinal-epoxy, and

(v) carbon, hydrogen, carbonyloxy oxygen, and amino nitrogen;

(c) said polymerized hydrophilic composition containing from 50 to about 70 weight percent of solubilized collagen and from less than 50 to about 30 weight percent of ethylenically unsaturated monomeric units, based on the total weight of the components.

4,388,429

FLAME RETARDANT POLYMER COMPOSITIONS

Charles S. Ilardo, Tonawanda, and Daniel J. Scharf, East Amherst, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Apr. 24, 1981, Ser. No. 257,082

Int. Cl.³ C08K *5/02, 5/15, 5/34*

U.S. Cl. 524—94 **13 Claims**

1. A fire retardant polymeric composition comprising a polyolefin polymer and an effective fire retardant proportion of the composition comprising

(1) a brominated aromatic component selected from the group consisting of polydibromophenylene oxide, decabromodiphenyl oxide, tetrabromo-ortho-chlorotoluene, and bis tetrabromophthalimide ethane, and

(2) a chlorinated organic component which is a diaduct of hexachlorocyclopentadiene and a polyunsaturated cyclic compound selected from the group consisting of 1,5 cyclooctadiene and furon and (3) antimony oxide

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4,388,430

ASSOCIATIONS FOR STABILIZING VINYL RESINS

Paul de Cointet de Fillain, Toulouse, and Charles Pigerol, Saint-Ouen, both of France, assignors to Sanofi, Paris, France

Filed Sep. 30, 1981, Ser. No. 307,298

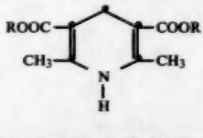
Claims priority, application France, Oct. 3, 1980, 80 21243

Int. Cl.³ C08K *5/17, 5/34;* **C09K** *15/20, 15/30*

U.S. Cl. 524—99 **11 Claims**

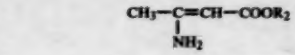
1. New stabilizing association for vinyl resins made up of vinyl polymers or copolymers, characterized by the fact that it includes a dihydropyridine derivative of the general formula:

I

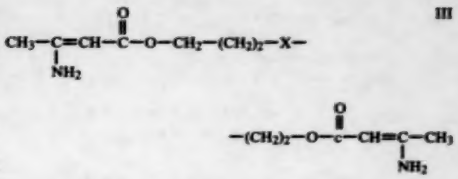


in which R represents a linear alkyl radical containing from 1 to 22 carbon atoms, a linear alkenyl radical containing 3 to 18 carbon atoms, a linear alkynyl radical containing 3 to 11 carbon atoms, or an aralkyl radical, optionally substituted in the ortho or para position by a halogen atom or by a methyl or methoxy radical, or R represents a phenyl radical, optionally substituted in the para position by a methoxy radical, or R represents a radical $R_1—O—(CH_2)_n—$ in which n has the value 2, 3, or 4, and R_1 represents a linear alkyl radical containing 1 to 4 carbon atoms or a phenyl radical, and a β-aminocrotonic acid derivative of the general formulas:

II



III



in which R_2 represents a linear alkyl radical with 1 to 8 carbon atoms or a mixture of linear alkyl radicals containing 16 to 18 carbon atoms, and X represents a sulfur or oxygen atom or a single bond.

3. Vinyl resins made up of vinyl polymers or copolymers characterized by the fact that they contain an association according to claim 1 as a stabilizer.

4,388,431

FLAMEPROOFED ORGANIC MATERIALS

Claudine Mauric, Basel, and Rainer Wolf, Allschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Feb. 13, 1980, Ser. No. 121,205

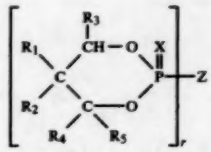
Claims priority, application Switzerland, Feb. 14, 1979, 1461/79; Feb. 23, 1979, 1839/79

Int. Cl.³ C08K *5/52, 5/53*

U.S. Cl. 524—119 **23 Claims**

1. Flameproofed polyester containing, as a flameproofing agent, a flameproofing effective amount of at least one compound of formula I,

I



wherein

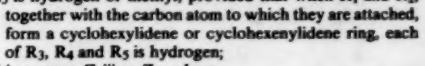
R_1 and R_2 are, independently, hydrogen; C_{1-4}alkyl; phenyl; or R_1 and R_2, together with the carbon atom to which they are attached, form a cyclohexylidene or cyclohexenylidene ring;

R_3 and R_4 are, independently, hydrogen or C_{1-4}alkyl;

R_5 is hydrogen or methyl, provided that when R_1 and R_2, together with the carbon atom to which they are attached, form a cyclohexylidene or cyclohexenylidene ring, each of R_3, R_4 and R_5 is hydrogen;

Z is a group Z_a''' or Z_b, where

Z_a''' is C_{1-10}-alkylene, C_{6-8}cycloalkylene, 2-butenylene or a group of the formula

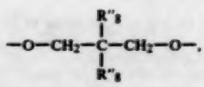


in which

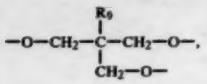
R_6 is hydrogen or methyl and

m'' is 2, 3 or 4; and

Z_b is a group of the formula



in which R_9'' is C_{1-4}alkyl, or a group of the formula



where R_9 is methyl or ethyl,
X is oxygen when Z is Z_a''' and oxygen or sulphur when Z is Z_b, and
r is 2 when Z is Z_a''' and 2 or 3 when Z is Z_b.

4,388,432

REPULPABLE ACRYLIC ACID BASED PRESSURE-SENSITIVE ADHESIVE

Robert R. Eskay, Woodbridge, N.J., assignor to Permacel, New Brunswick, N.J.

Filed Dec. 15, 1981, Ser. No. 330,936
Int. Cl.³ C08K *5/05*
U.S. Cl. 524—388 **11 Claims**

1. A high-temperature shear-resistant, water-dispersible pressure-sensitive adhesive comprising (1) a copolymer of from about 85 to about 97 percent by weight of acrylic acid compound and from about 15 to about 3 percent by weight of acrylamide, said acrylic acid compound including at least about 75 weight percent acrylic acid and about 25 to about 0 weight percent of a plasticizing monomer, (2) a plasticizer-tackifier comprising a polyhydric alcohol compound in an amount of from about 100 to 500 parts for every 100 parts of copolymer and (3) from about 0.5 to 2.5 percent based on copolymer of caustic.

4,388,433

SHELF-STABLE CATALYST COMPONENT FOR RTV SILICONE COMPOSITION

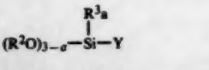
Steven H. Klein, Clifton Park, and Alfred H. Smith, Jr., Ballston Lake, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Feb. 26, 1981, Ser. No. 238,333
Int. Cl.³ C08L *83/06*
U.S. Cl. 524—401 **20 Claims**

1. A process for producing a shelf-stable catalyst component for a room temperature vulcanizable silicone rubber composition comprising:
(a) mixing 100 parts by weight of an organo polysiloxane fluid of a viscosity varying from 1,000 to 50,000 centipoise where the organo group is a monovalent hydrocarbon group, with a first portion of a mixture of crosslinking agent, catalytic promoter and self-bonding additive effective for providing a stable catalyzed paste base mixture of said composition upon heat cycling of said base mixture wherein said first portion constitutes 1 to 15 percent by weight of the total amount of crosslinking agent, catalytic promoter and self-bonding agent utilized in said shelf-stable catalyst component for a room temperature vulcanizable silicone rubber composition and is comprised of:
(1) an alkyl silicate crosslinker of the formula:

$$R_mSi(OR^1)_{4-m}$$

or partial hydrolysis products thereof wherein R and R_1 are monovalent hydrocarbon radicals, m is 0 or 1;
(2) a tin salt catalytic promoter and
(3) a self-bonding additive of the formula:



where R^2 and R^3 are alkyl radicals of 1 to 8 carbon atoms, a is 0 or 1 and Y is a nitrogen-functional radical which is a saturated, unsaturated or aromatic residue which in addition to nitrogen functionality may be functionalized by a radical selected from the class consisting of amino, cyano, thio, oxo, and ester, and multiples and combinations thereof; and after there is a uniform mixture of (a);
(b) adding to the mixture from 10 to 250 parts of filler and mixing the ingredients to a uniform mixture and heating the mixture to a temperature of at least 100° C. for at least 1 hour thereby providing a stable paste-like base mixture; and
(c) mixing into the base mixture a second portion consisting of the remainder of the cross-linking agent, the catalytic promoter and self-bonding additive; and mixing to a uniform fluid mixture by agitating the base mixture and the rest of the ingredients for at least 30 minutes wherein the entire process is carried out in the substantial absence of moisture.

4,388,434

LITHOGRAPHIC INK VEHICLE CONTAINING ADDITION POLYMER AND ALIPHATIC HYDROCARBON SOLVENT

Graham Swift, Bluebell; Harry J. Cenci, Warminster, both of Pa., and Raymond F. Jenkins, Masonville, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 5,930, Jan. 24, 1979, which is a continuation-in-part of Ser. No. 893,646, Apr. 4, 1978, abandoned, which is a continuation of Ser. No. 766,391, Feb. 7, 1977, abandoned. This application Dec. 8, 1980, Ser. No. 214,057
Int. Cl.³ C08K *5/01*
U.S. Cl. 524—476 **10 Claims**

1. A printing ink containing a colorant, a polymer, and a hydrocarbon solvent comprising by weight at least 70% of aliphatic hydrocarbons and no more than about 25% of aromatic hydrocarbons, said solvent having a kauri-butanol number of between 18 and 31, said polymer being an addition polymer of polymerized ethylenically unsaturated monomers dissolved in said solvent, the $\overline{M}w$ of the polymer being from 1,000 to 15,000 as determined by gel permeation chromatography, and the calculated T_g of the polymer being from 40° C. to 200° C., and in which the monomers from which the polymer is prepared include at least about 15% of at least one of isobutyl methacrylate, s-butyl methacrylate, isobornyl methacrylate, isobornyl acrylate, dicyclopentenyl methacrylate, dicyclopentenyl acrylate, dicyclopentenylethoxy methacrylate, dicyclopentenylethoxy acrylate, dicyclopentenylneopentoxy methacrylate, dicyclopentenylneopentoxy acrylate, and a vinyl aromatic monomer, with the proviso that no more than about 40% of the total monomers is used in the form of styrene or isobornyl methacrylate, said copolymer containing no more than about 5% methyl methacrylate.

4,388,435

AQUEOUS PIGMENT PASTES AND THEIR USE

Werner Loch, Erpolzheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 10, 1981, Ser. No. 320,020
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1981, 3121765
Int. Cl.³ C08L *39/06*
U.S. Cl. 524—548 **7 Claims**

1. A pigment paste comprising
(A) from 15 to 60% by weight of water;
(B) from 15 to 50% by weight of one or more organic solvents;
(C) from 0.1 to 20% by weight of a copolymer of
(a) from 10 to 75% by weight of one or more water-immiscible, or only partially water-miscible, copolymerizable α,β-olefinically unsaturated compounds and
(b) from 25 to 90% by weight of one or more water-soluble copolymerizable N-vinyl compounds; and
(D) from 10 to 79% by weight of one or more finely divided pigments or fillers, or mixtures of pigments and fillers,

dispersed in the mixture of (A), (B), (C), the sum of the percentages of (A), (B), (C) and (D) being 100.

4,388,436

PERMEABLE CONTACT LENS

Richard Chen, Phoenix, Ariz., assignor to National Patent Development Co., New York, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,481
Int. Cl.³ C08F 20/54; G02C 7/04
U.S. Cl. 524—553 26 Claims

10. A water-swellable, water-insoluble hydrophilic contact lens formed from a cross-linked copolymer of N,N-(C_1-C_2alkyl)acrylamide and cyclohexyl methacrylate having a molar ratio of 3.5 to 5.5:1.

4,388,437

AMINO-FUNCTIONAL SILICONE EMULSIONS

Isao Ona, Sodegaura, Japan, assignor to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 332,063
Claims priority, application Japan, Dec. 29, 1980, 55-187704
Int. Cl.³ C08L 83/06
U.S. Cl. 524—588 6 Claims

1. An organopolysiloxane composition consisting essentially of

(A) 100 parts by weight of an organopolysiloxane having the formula $R_aX_bY_cSiO(4-a-b-c)/2$; wherein R denotes a monovalent unsubstituted or substituted hydrocarbon group free of amino substitutents, X denotes an amino-functional group having the formula $-R^1(NHCH_2CH_2)_dNHR^2$ wherein R^1 denotes a divalent hydrocarbon group, R^2 denotes a hydrogen atom or a monovalent hydrocarbon group and d has a value of 0, 1, 2, or 3; Y denotes a hydroxyl group or an alkoxy group, a+b+c has a value of from greater than 1.9001 to 2.1, a has a value of from greater than 1.9 to less than 2.1, b has a value of from 0.0001 to 0.1 and c has a value of from 0 to 0.1,

(B) 1 to 100 parts by weight of a nonionic or cationic surfactant,

(C) 0.1 to 50 parts by weight of an organotitanate, an organozirconate, or an organogermanate,

(D) a sufficient amount of an organic acid to provide a pH of from 2.5 to less than 7.0 for the organopolysiloxane composition and

(E) an emulsion-forming amount of water.

4,388,438

AQUEOUS DISPERSIONS OF COPOLYMERS OF STYRENE DIBUTYL MALEATE AND ACRYLIC OR METHACRYLIC ACID OR MONOBUTYL MALEATE AND METHOD FOR PREPARATION THEREOF

Maria Knypl; Eugeniusz Knypl; Marian Starzak, all of Oswiecim; Ewa Mieczkowska, Katowice; Urszula Pawlus, Siemianowice Slaskie; Romuald Palubicki, Katowice; Mieczyslaw Ficek, and Jozef Goldynia, both of Oswiecim, all of Poland, assignors to Osrodek Badaw Cze-Rozwojowy Kauczukow I Tworzyw Winylowych, Oswiecim, Poland

Filed Jan. 6, 1981, Ser. No. 224,476
Claims priority, application Poland, Jan. 10, 1980, 221298
Int. Cl.³ C08L 35/06
U.S. Cl. 524—833 5 Claims

1. A method for preparing an aqueous dispersion of a copolymer of styrene, dibutyl maleate and acrylic or methacrylic acid or monobutyl maleate, said method consisting in emulsion polymerization of a mixture of monomers containing styrene in the amount of 40–90 percent by weight, dibutyl maleate in the amount of 10–60 percent by weight, and acrylic or methacrylic acid or monobutyl maleate in the amount of 1.0–10.0 percent by weight in relation to the sum total of monomers, said monomer mixture being added to a water phase previously prepared by adding a free radical polymerization initiator in one dose in the amount of 0.3 percent by weight to water containing a mixture of ionic and non-ionic emulsifiers in a ratio of 1:3–10 and in the amount of 2–8 percent by weight; a buffer in the amount of 0.2–1.0 percent by weight; the sodium salt of an α,β-ethylenically unsaturated carboxylic acid in the amount of 0.1–1.0 percent by weight; a water souble ethylenically unsaturated monomer containing an N-methylol group in the amount of 0.3–3.0 percent by weight and an alkylene glycol containing 2–6 carbon atoms in the alkylene radical in the amount of 1–6 percent by weight relative to the sum total of monomers, the ratio of alkylene glycol to the amount of acrylic or methacrylic acid or monobutyl maleate contained in the monomer mixture being 1:0.2–2.0; said polymerization being conducted at a temperature from 70°–90° C. until the monomer reaction has been completed and then cooling the reaction mixture to a temperature of 10°–30° C. and neutralizing the mixture to a pH value of 9.5 by the addition of a concentrated water solution of ammonia.

4,388,439

WET-STRENGTH RESIN FOR PAPER AND METHOD OF PREPARING SAME

William W. Maslanka, London-Britain Township, Chester County, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 761,101, Jan. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 554,999, Mar. 3, 1975, abandoned. This application Oct. 26, 1981, Ser. No. 314,909
Int. Cl.³ C08L 77/06
U.S. Cl. 524—845 15 Claims

1. A method of preparing an aqueous solution of a water-soluble, cationic thermosetting resin which consists essentially of reacting methylbisaminopropylamine and a diester of oxalic acid to form a polyaminopolyamide containing tertiary amines, the mole ratio of amine to diester being from about 0.9:1 to about 1.2:1 and then reacting the polyaminopolyamide in aqueous solution in the form of its acid salt with an epihalohydrin, said acid salt being prepared by adding to an aqueous dispersion of the polyaminopolyamide a water-soluble acid in an amount essentially stoichiometrically equivalent to the tertiary amines of the polyaminopolyamide, the amount of epihalohydrin employed being from about 1 mole to about 1.5 moles per mole of tertiary amine of the polyaminopolyamide.

4,388,440

POLYESTER RESIN BLEND

James G. Murray, East Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 27,171, Apr. 4, 1979, which is a continuation-in-part of Ser. No. 870,780, Jan. 19, 1978, abandoned. This application Aug. 5, 1980, Ser. No. 175,553
Int. Cl.³ C08L 67/06
U.S. Cl. 525—49 4 Claims

1. A resin composition which comprises an unsaturated polyester and a polymerizable mixture of isomers of methyl ethenyl benzene consisting essentially of 1-methyl-2-ethenyl benzene, 1-methyl-3-ethenyl benzene, and 1-methyl-4-ethenyl benzene, in the following proportions by weight:

1-methyl-2-ethenyl benzene 0 to 0.1%
1-methyl-3-ethenyl benzene 1 to 10%
1-methyl-4-ethenyl benzene at least 90%;

said composition having a lower viscosity and a lower exotherm upon curing than the corresponding compositions in which said isomers comprise methyl ethenyl benzene containing 60% or more of the meta isomer and 40% or less of the para isomer.

4,388,441

INDUCTION OF IMMUNOLOGICAL TOLERANCE

David H. Katz, La Jolla, Calif., assignor to Scripps Clinic & Research Foundation, La Jolla, Calif.

Division of Ser. No. 764,586, Feb. 3, 1977, Pat. No. 4,191,668. This application Aug. 28, 1978, Ser. No. 937,574

Int. Cl.³ C08G 69/48, 69/50

U.S. Cl. 525—54.1 4 Claims

1. A therapeutic immunosuppressive agent capable of inducing specific immunological tolerance to an antigen by suppression of antibody response, comprising a conjugate of D-glutamic acid:D-lysine copolymer and the antigen benzylpenicilloyl.

4,388,442

STABILIZER OR DISPERSING AGENT FOR USE IN A SUSPENSION POLYMERIZATION OF A VINYL COMPOUND COMPRISING A MODIFIED AND PARTIALLY HYDROLYZED ANIONIC POLYVINYL ALCOHOL

Yasuo Taniguchi; Toshio Asano; Haruo Funami, and Kouichi Itou, all of Quni, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1980, Ser. No. 195,737

Claims priority, application Japan, Oct. 13, 1979, 54-132296; Oct. 13, 1979, 54-132297; Oct. 23, 1979, 54-136589; Nov. 28, 1979, 54-153870

Int. Cl.³ C08F 8/12, 8/36, 8/40, 8/46

U.S. Cl. 525—60 11 Claims

1. A stabilizer or dispersing agent for use in a suspension polymerization of a vinyl compound, comprising a modified and partially hydrolyzed polyvinyl alcohol having an average polymerization degree of from 200 to 3,000 and an average hydrolysis degree of from 60 to 90 mol% and including anion hydrophilic groups at the side chains thereof, wherein said anion hydrophilic groups are selected from the group consisting of dicarboxyl groups, and/or esters, and/or salts thereof, sulfuric esters and/or salts thereof, and phosphoric esters and-/or salts thereof, and mixtures thereof, and the content of said anion hydrophilic groups is in the range of from 0.02 to 10 mol% per unit mol of the polyvinyl alcohol.

4,388,443

MOLDABLE POLYBLENDS

Larry G. Bourland, Downingtown, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 19, 1982, Ser. No. 350,516

Int. Cl.³ C08L 69/00, 67/04

U.S. Cl. 525—67 9 Claims

1. A moldable polyblend comprising a polylactone, a polycarbonate and a rubber-modified copolymer of styrene and maleic anhydride wherein said polylactone is employed in an amount within the range of from about 1 to about 10 weight percent of the polyblend.

4,388,444

PREPARING BLENDS OF A SYNTHETIC RUBBER WITH A POLY(ARYLENE OXIDE) BY DISTILLATIVE DISPLACEMENT

Howard B. Irvin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 5, 1982, Ser. No. 375,168

Int. Cl.³ C08L 71/04

U.S. Cl. 525—92 22 Claims

1. A process for preparing a poly(arylene oxide) resin/rubbery diene/monovinylarene block copolymer blend which comprises:

(a) contacting in fractionation means a rubbery diene/-monovinylarene polymer-in-cycloaliphatic solvent solution with hot aromatic hydrocarbon solvent vapors, thereby taking cycloaliphatic solvent vapors as overhead, and producing a rubbery copolymer-in-aromatic hydrocarbon solvent bottoms,

(b) flash evaporating at least a portion of said aromatic solvent from said rubbery copolymer-in-aromatic solvent bottoms, thereby producing aromatic solvent vapor overhead, and a stream of concentrated copolymer-in-aromatic solvent,

(c) dissolving poly(arylene oxide) resin in hot aromatic solvent to produce a poly(arylene oxide)-in-aromatic solvent solution,

(d) blending said concentrated rubbery copolymer-in-aromatic solvent solution with said poly(arylene oxide)-in-aromatic solvent solution to produce a blended polymeric admixture-in-aromatic solvent,

(e) steam-sripping said blended polymeric admixture in aromatic solvent, thereby producing a recycle aromatic solvent stream and a blended rubbery copolymer/poly(arylene oxide) crumb in water, and

(f) recycling aromatic solvent from said steam-stripping at least in part to said (c) poly(arylene oxide) dissolving step and said (a) rubber-in-cycloaliphatic solvent contacting steps.

4,388,445

HEAT-CURABLE COATING COMPOSITION

Shinji Sugiura, and Kyoichi Horibe, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Jan. 19, 1982, Ser. No. 341,154

Claims priority, application Japan, Jan. 23, 1981, 56-7819

Int. Cl.³ C08F 8/00

U.S. Cl. 525—124 9 Claims

1. A heat-curable coating composition comprising, as a binder, a composition consisting of

(A) 15 to 60% by weight of an oil-free polyester in which at least 30 mole% of the acid component consists of a saturated alicylic polybasic acid, said polyester having a composition on or within the four sides of a tetragon defined by the four points of (0.8, 60), (0.8, 100), (1.00, 70) and (1.00, 100), on coordinates in which the abscissa represents the molar ratio of the polybasic acid component to the polyhydric alcohol component of the polyester (dibasic acid ratio), and the ordinate represents the proportion in mole% of a glycol having at least 3 carbon atoms in the polyhydric alcohol component,

(B) 5 to 40% by weight of an alkyd resin having an oil length of 15 to 50% and a hydroxyl value of 40 to 200,

(C) 5 to 40% by weight of a hydroxyl-containing acrylic resin having a hydroxyl value of 20 to 200 and a number average molecular weight of 1,000 to 30,000, and

(D) 10 to 40% by weight of a crosslinking agent, said weight percentages being based on the total weight of the binder.

4,388,446

POLYETHYLENE TEREPHTHALATE BLENDS

Edwin D. Hornbaker, and Jesse D. Jones, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 230,253, Jan. 30, 1981, abandoned, and a continuation-in-part of Ser. No. 191,359, Sep. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 162,067, Jun. 23, 1980, abandoned, said Ser. No. 230,253, is a continuation-in-part of Ser. No. 162,067, , abandoned. This application Sep. 14, 1981, Ser. No. 301,936

Int. Cl.³ C08L 67/02

U.S. Cl. 525—175 13 Claims

1. A thermoplastic composition which comprises in intimate admixture:

(a) a polyethylene terephthalate, and

(b) a copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic imide;

said composition having a heat deflection temperature of at least about 80° C. at 264 psi as measured by the ASTM procedure D 648-72.

4,388,447
PROCESS FOR PRODUCING RUBBER MODIFIED STYRENE RESINS

Mune Iwamoto; Norifumi Ito; Yuzuru Ishida, all of Yokohama; Yasuo Furuta, Hiratsuka, and Tetsuyuki Matsubara, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Nov. 19, 1981, Ser. No. 323,064
Claims priority, application Japan, Dec. 5, 1980, 55/170889
Int. Cl.³ C08F 279/02
U.S. Cl. 525—316 9 Claims

1. A process for continuously producing rubber modified styrene resins from a rubber-like polymer and a styrene monomer according to solution or bulk polymerization techniques, which comprises

(A) transforming the rubbery phase including said rubber-like polymer into dispersed particles in a stirred-tank reactor having both a helical-blade agitator mounted in a draft tube and an auxiliary agitator for causing the stream of fluid having just entered said reactor to diverge and flow in various directions;

(B) controlling the agitating efficiency of said agitators in such a way that the average number of circulations of the fluid within said reactor is not less than 20 per hour;

(C) operating said helical-blade agitator in such a way that the value of $N^2 \cdot D$ satisfies

$$20 > N^2 \cdot D > 0.15$$

where N is the rotational speed, in rps, of said helical-blade agitator and D is the diameter, in meters, of said helical-blade agitator; and

(D) determining the operating conditions in such a way that the values of X_1 and X_2 satisfy

$$20 \geqq X_1$$

and

$$50 \geqq X_2 \geqq 2.4X_1 - 0.05X_1^2$$

where X_1 is the weight percentage of said rubber-like polymer and X_2 is the weight percentage of the polymerizable monomer converted to polymer, said weight percentages being based on the total amount of all components within said reactor.

4,388,448
GLYCIDYL METHACRYLATE POLYMERS, THEIR PREPARATION AND SOLVOLYSIS PRODUCTS

Lester R. Melby, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 23, 1981, Ser. No. 236,854
Int. Cl.³ C08F 2/00, 24/00
U.S. Cl. 525—327.3 10 Claims

1. A polymer selected from the group consisting essentially of:

(i) poly(glycidyl methacrylate), and

(ii) copolymer of glycidyl methacrylate and at least one other methacrylate ester capable of anionic polymerization,

each of said polymer (i) and copolymer (ii) characterized by having

(a) a polydispersity index (M_w/M_n) between about 1.0 to 1.4, and

(b) substantially all glycidyl methacrylate epoxide functions intact;

polymer (i) and copolymer (ii) being represented by the formula

$$A\text{-}(\text{-AMA})_x(\text{GMA})_y(\text{RMA})_zQ$$

wherein

A is the organic moiety of an organo(alkali metal) compound used to form an initiator adduct with AMA, said organo(alkali metal) compound being selected from the group consisting essentially of 1,1 diphenylhexyl(alkali metal), adduct of an alkyl(alkali metal) with 1,1-diaryl-substituted ethylene wherein the aryl substituents are free of electrophilic substituents, diisopropylamido(alkali metal), adduct of a secondary or tertiary alkyl(alkali metal) with a pyridine unsubstituted in the 2,5 and 6 positions wherein adduct substituents are nonelectrophilic, cumyl and cumyl-type alkali metal derivatives free of electrophilic substituents, and polynuclear hydrocarbon-alkali metal adducts;

AMA is alkyl methacrylate in which the alkyl group has 1 to 18 carbon atoms;

GMA is glycidyl methacrylate;

RMA represents one or more methacrylate esters selected from the group consisting essentially of alkyl of 1 to 18 carbon atoms, alkenyl of 2 to 18 carbon atoms, alkadienyl of 5 to 18 carbon atoms, dialkylaminoalkyl of about 4 to 12 carbon atoms, alkoxyalkyl of about 3 to 12 carbon atoms, and lower fluoroalkyl;

x is the number of methacrylate units in the initiator adduct and is at least 1;

y is the total number of combined GMA units in the chain, and is at least 1 when z is greater than zero, and at least 6 when x is 1 to 3 and z is zero;

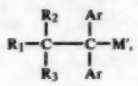
z is the total number of combined RMA units in the chain and is zero in a homopolymer and greater than zero in a copolymer; and

Q is a terminating group formed by terminating the polymerization with a protic material or by warming to room temperature.

5. A method for preparing the polymer of claim 1 characterized by contacting glycidyl methacrylate monomer or a combination of glycidyl methacrylate and one or more other methacrylate esters with a polymerization initiator that is the reaction product of an organo(alkali metal) compound and at least one mole of a lower alkyl methacrylate, in solution at reduced temperature;

the organo(alkali metal) compound being selected from the group consisting essentially of:

(i) a compound of the formula



wherein:

R_1 = alkyl,

R_2 = H or alkyl,

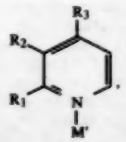
R_3 = H or alkyl,

Ar is aryl,

M′ = alkali metal;

(ii) diisopropylamido(alkali metal);

(iii) a compound of the formula



wherein R_1 is secondary or tertiary alkyl and R_2, R_3, and M′ are as defined;

(iv) a compound of the formula

wherein R_1 and R_2 are alkyl and Ar and M' are as defined; and

(v) polynuclear hydrocarbon-alkali metal adducts.

4,388,449

SILICONE RESIN

Jean-Claude Bonnet, Saint Aignan, France, and Kenneth B. Pithouse, Swindon, England, assignors to Raychem Limited, London, England

Continuation of Ser. No. 130,142, Mar. 13, 1980, abandoned, which is a continuation of Ser. No. 927,769, Jul. 25, 1978, abandoned. This application Dec. 16, 1981, Ser. No. 331,237

Claims priority, application United Kingdom, Jul. 27, 1977, 31536/77

Int. Cl.³ C08F *283/00*

U.S. Cl. 525—477 **28 Claims**

1. A melt processable thermoplastic monoorganopolysiloxane resin comprising units of the formula $RSiO_{1.5}$ and $R_1R_2R_3SiO_{0.5}$ wherein each of R, R_1, R_2 and R_3 is independently hydrogen, or an organic group, at least 85% of the R groups in the $RSiO_{1.5}$ units being organic groups, and at least two of the groups R_1, R_2 and R_3 in each $R_1R_2R_3SiO_{0.5}$ unit being organic groups, and in which the molar ratio of $RSiO_{1.5}$ units to $R_1R_2R_3SiO_{0.5}$ units is from 1:0.005 to 1:0.03 respectively, and wherein the organopolysiloxane contains Si—OH groups, the percentage by weight of said hydroxyl groups, based on the weight of the resin, being less than 2% and which has a number average molecular weight in the range of from 2,000–6,000, as measured by vapor phase osmometry.

4,388,450

AROMATIC POLYVINYL ETHERS AND HEAT CURABLE MOLDING COMPOSITIONS OBTAINED THEREFROM

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 13, 1981, Ser. No. 243,302

The portion of the term of this patent subsequent to Nov. 6, 1996, has been disclaimed.

Int. Cl.³ C08L *61/12, 61/08, 29/10*

U.S. Cl. 525—502 **9 Claims**

1. Heat curable compositions comprising,

(A) aromatic polyvinylethers selected from

(i) polyvinyl compounds having the formula,

$$R[GR^1OC(R^2)=C(R^3)_2]_n, \text{ and}$$

(ii) reaction products comprising said polyvinyl compounds and from 0.1 to 1 mole, per mole of said polyvinyl compounds of an active hydrogen compound selected from polycarboxylic acids, phenols, thiols, silanes and polyols, and

(B) an effective amount of a thermal curing catalyst comprising (a) an arylonium salt selected from a diaryliodonium salt and a dialkyl hydroxyarylsulfonium salt and (b) from 0.1 part of 10 parts, per part of said arylonium salt of an organic oxidant or an aromatic polyvinylether soluble copper compound, which thermal curing catalyst is capable of generating an acid having a pK value lower than 14, when the heat curable composition is heated to a temperature of at least 25° C., where G is selected from the class consisting of

and mixtures thereof,

R is a polyvalent aromatic organic radical, R^1 is a $C_{(1-8)}$ alkylene radical, R^2 and R^3 are the same or different monovalent radicals selected from hydrogen, halogen and $C_{(1-8)}$alkyl radicals, and n is an integer equal to 2–10 inclusive.

4,388,451

POLYMERS DERIVED FROM ALLYLPHENOL OR SUBSTITUTED ALLYLPHENOL AND MALEIC ANHYDRIDE

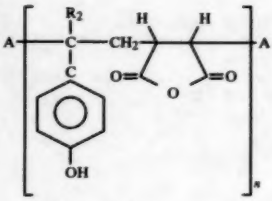
Billy M. Culbertson, Worthington; Larry K. Post, Columbus, both of Ohio, and Ann E. Aulabaugh, Madison, Wis., assignors to Ashland Oil, Inc., Ashland, Ky.

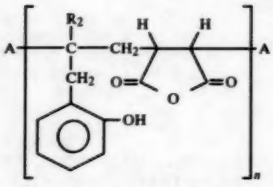
Filed Sep. 28, 1981, Ser. No. 306,198

Int. Cl.³ C08F *26/00, 22/40*

U.S. Cl. 526—271 **3 Claims**

1. A polymer consisting of one of the following two general formulas:





wherein R_2 represents H or —CH_3; A represents terminal groups of a polymer chain; and n is an integer greater than 10.

4,388,452

OLEFIN-ACRYLONITRILE COPOLYMERS AND USES THEREOF

Michael I. Naiman, and Rudolf S. Buriks, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 810,342, Jun. 27, 1977, Pat. No. 4,333,741. This application Oct. 16, 1981, Ser. No. 312,063

Int. Cl.³ C08F *220/42*

U.S. Cl. 526—342 **3 Claims**

1. A copolymer of a 1-alkene and acrylonitrile wherein the 1-alkene has from 6 to 28 carbon atoms, the molar ratio of acrylonitrile to 1-alkene is about 2:1 to 5:1 and the molecular weight of the copolymer is from about 1,000 to about 100,000.

4,388,453

CROSSLINKED ORGANOPOLYSILOXANES HAVING LIQUID-CRYSTALLINE PROPERTIES

Heino Finkelmann; Günther Rehage, both of Clausthal-Zellerfeld, Fed. Rep. of Germany, and Franz-Heinrich Kreuzer, Martinsried, all of Fed. Rep. of Germany, assignors to Consortium für Elektrochemische, Munich, Fed. Rep. of Germany

Filed May 5, 1982, Ser. No. 375,152

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119459

Int. Cl.³ C08G 77/06

U.S. Cl. 528—15 4 Claims

1. Three dimensional crosslinked organopolysiloxanes having liquid-crystalline properties which have mesogenic molecules chemically bonded to the organopolysiloxane lattice.

2. The organopolysiloxanes of claim 1, wherein the organopolysiloxanes have nematic or chiral nematic properties.

3. A process for preparing the crosslinked organopolysiloxanes of claims 1 or 2, wherein an organohydrogenopolysiloxane is reacted with a mixture containing vinyl-substituted mesogenic molecules and an organopolysiloxane having a vinyl group in each terminal unit, in which at least a stoichiometric number of vinyl groups and Si-H groups are present in the reaction mixture, in the presence of a catalyst capable of promoting the addition of Si-H to aliphatic multiple bonds.

4,388,454

POLYESTER

Werner Rieder, Vienna, Austria, and Martin Fehrle, Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to Isovolta Osterreichische Isolierstoffwerke, Wiener Neudorf, Austria

Filed May 5, 1982, Ser. No. 375,205

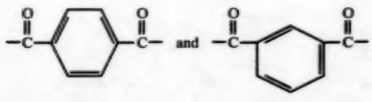
Claims priority, application Austria, Dec. 9, 1981, 5278/81; European Pat. Off., May 7, 1981, 81-890076.3

Int. Cl.³ C08G 63/02

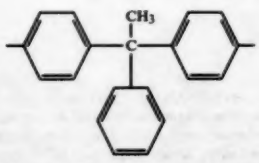
U.S. Cl. 528—176 20 Claims

1. An organic, high-molecular weight polyester containing substantially chain members of the formula

wherein X is at least one member selected from the group consisting of



and Y has the formula



having an inherent viscosity of at least 1.0 dl/g measured at 30° C. in a solution of 0.5 g of the polyester in 100 ml of a mixture of 60% by weight of phenol and 40% by weight of 1,1,2,2-tetrachloroethane and whose films cast from a chlorinated organic solution have an elongation at break of more than about 20%.

4,388,455

PROCESS FOR PREPARING ESTER CARBONATE COPOLYMERS

Stephen E. Bales, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 17, 1982, Ser. No. 378,693

Int. Cl.³ C08G 63/64

U.S. Cl. 528—176 10 Claims

1. A process for making ordered ester/carbonate copolymers which process comprises the steps of (1) contacting in an organic liquid medium a dihydric organic compound with a carbonate precursor and a diacid halide under conditions such that the carbonate moieties in the resultant intermediate oligomer are formed simultaneously with or before the formation of ester moieties and (2) contacting this oligomer with additional carbonate precursor under conditions sufficient to form the desired ordered ester/carbonate copolymer.

4,388,456

COPOLYESTERS HAVING IMPROVED GAS BARRIER PROPERTIES

Robert B. Barbee, Kingsport, and Larry A. Minnick, Bluff City, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,739

Int. Cl.³ C08G 69/44, 73/16

U.S. Cl. 528—289 10 Claims

1. Copolyesters characterized by relatively high glass transition temperatures and low oxygen permeability, said copolyesters being derived from

A. 100 mol % of an acid component comprising about 5–75 mol % isophthalic acid and about 95–25 mol % 4-carboxy-N-(carboxymethyl)phthalimide, and

B. 100 mol % of a glycol component, at least 80 mol % of said glycol component being ethylene glycol.

4,388,457

PHYLLANTHOSTATIN COMPOUNDS

George R. Pettit, Paradise Valley, Ariz., assignor to University Patents, Inc., Norwalk, Conn.

Filed Feb. 11, 1982, Ser. No. 348,114

Int. Cl.³ C07H 7/06, 13/00; A61K 31/71

U.S. Cl. 536—4.1 3 Claims

1. Phyllanthostatin 1 which has the following characteristics:

Melting point—125°–126° C.;

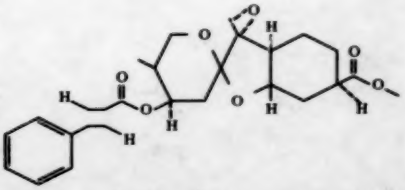
Field desorption mass spectrum—m/e 805 ($M^+ + H$);

Optical rotation—$[\alpha]_D^{26} - 3.6°$ (c 0.83, $CHCl_3$);

Ultra violet absorption spectrum—ν_{max}^{MeOH} nm (log ϵ) 216 (4.19), 222 (4.12) and 277 (4.29);

Infrared absorption spectrum—(KBr) ν_{max} 3450, 1755, 1740, 1710, 1640, 1452, 1380, 1310, 1245, 1170, 1075 and 770 cm^{-1};

and which can be shown by the following structural formula:



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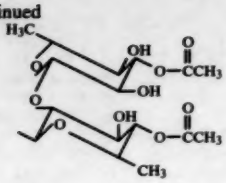


4,388,458

USE OF ULTRASONIC ENERGY TO IMPROVE NITROCELLULOSE PURIFICATION

Robert P. Baumann, Mine Hill; Marcel Blais, Newton, and Irwin Spiess, Pequannock, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 24, 1981, Ser. No. 334,118
Int. Cl.³ C08B 5/04
U.S. Cl. 536—38 3 Claims

1. A process for removing trace sulfuric acid from nitrocellulose fibers comprising:

dispersing nitrocellulose fibers in water;

subjecting the nitrocellulose fibers and water dispersion to ultrasonic energy for a time period and at an energy level sufficient to enhance nitrocellulose fibers contact with water and facilitate sulfuric acid dispersal in the water;

separating waste water containing the traces of sulfuric acid contaminant from the nitrocellulose fibers; and

recovering purified nitrocellulose fibers.

4,388,459

CERTAIN CINNAMIC ACID OR PROPIOLIC ACID DERIVATIVES

Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 8,467, Feb. 1, 1979, Pat. No. 4,259,352. This application Nov. 28, 1980, Ser. No. 211,165
Int. Cl.³ C07D 213/64; C07C 101/46
U.S. Cl. 542—427 6 Claims

2. The compound 3-pyridyl p-[7-(cyclopentyl)heptylamino]-cinnamate.

4. The compound p-[4-(propyl)cyclohexylamino]cinnamic acid.

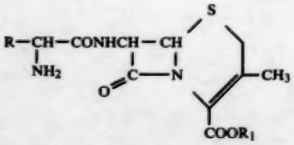
4,388,460

CEPHALOSPORINE DESACETOXY ESTERS AND SALTS THEREOF

Marco Falciani, and Renato Broggi, both of Milan, Italy, assignors to Dobfar S.p.A., Milan, Italy

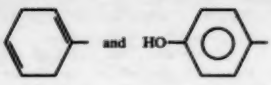
Filed Mar. 4, 1981, Ser. No. 240,309
Claims priority, application Italy, Apr. 17, 1980, 21463 A/80
Int. Cl.³ C07D 501/22
U.S. Cl. 544—23 9 Claims

1. Esters of desacetoxy cephalosporines having the formula

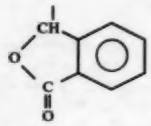


(I)

wherein R is selected from the group consisting of:



and R_1 is selected from the group consisting of



and $-CH_2-OCOC(CH_3)_3$.

4,388,461

PROCESS FOR PRODUCING ALPHA-PICOLINE

Clarence D. Chang, Princeton, and Patrick D. Perkins, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 326,258, Dec. 1, 1981, abandoned. This application Jun. 2, 1982, Ser. No. 384,360
Int. Cl.³ C07D 213/09, 213/73
U.S. Cl. 546—251 14 Claims

1. A method of making an alpha-picoline by contacting a phenolic compound with ammonia or an amine in the presence of a crystalline zeolite catalyst having a silica:alumina ratio of at least 12 and a Constraint Index of 1 to 12 and separating the alpha-picoline from the resulting product stream.

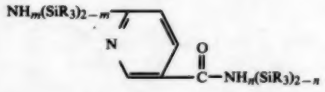
4,388,462

TRIALKYLSILYL-6-AMINONICOTINAMIDES

Raphael Pappo, and Kenneth M. Otteson, both of Redwood City, Calif., assignors to International Plant Research Institute, Inc., San Carlos, Calif.

Filed Jul. 20, 1981, Ser. No. 284,896
Int. Cl.³ C07F 7/10
U.S. Cl. 546—14 14 Claims

1. A trialkylsilyl-6-aminonicotinamide having the following formula:



wherein:

R is an alkyl group and all three of said alkyl groups contain no more than 24 carbon atoms; and

n and m are 0 to 2 and at least one of n and m is 1.

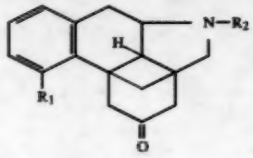
4,388,463

6-KETO-MORPHINAN ANALGESICS

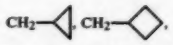
Arnold Brossi; Helmut Schmidhammer, both of Bethesda; Arthur E. Jacobson, Potomac, and Fu-Lian Hsu, Rockville, all of Md., assignors to The United States of America as represented by Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Jul. 16, 1981, Ser. No. 284,088
Int. Cl.³ C07D 221/28; A61K 31/485
U.S. Cl. 546—74 12 Claims

1. A compound according to the following formula and pharmaceutically acceptable acid addition salts thereof:



where R_1=OCH_3, $OCOCH_3$, or H;
R_2=CH_3, CH_2—CH=CH_2,



or $C_2H_2CH_6CH_5$.

12. (−)-6-Ketomorphinan.

4,388,464

THIADIAZOLYL-GLYOXYLONITRILE-2-OXIME ETHER DERIVATIVES FOR PROTECTING PLANT CROPS

Haukur Kristinsson, Bottmingen; Beat Muller, Reinach, and Johannes P. Pachlatko, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

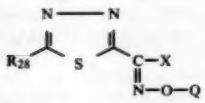
Division of Ser. No. 70,288, Aug. 28, 1979, Pat. No. 4,347,372. This application Feb. 9, 1981, Ser. No. 232,752

Claims priority, application Switzerland, Sep. 1, 1978, 9255/78

Int. Cl.³ A01N *43/82, 47/40;* **C07D** *285/12*

U.S. Cl. 548—136 **6 Claims**

1. A compound of the formula



wherein

R_{28} is lower alkoxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl or phenyl,

Q is hydrogen; lower alkyl which can be interrupted by oxygen or sulfur, or substituted by halogen or cyano; or an aliphatic carboxylic acyl radical, and

X is hydrogen, cyano, halogen, C_1–C_{10} alkyl, lower alkanoyl, —COOH, —COO—lower alkyl, —COS—lower alkyl, or —$CON(R)_2$ in which R is hydrogen or lower alkyl.

4,388,465

PREPARATION OF PHENOXY-AZOLYL-BUTANONE DERIVATIVES

Hans-Ludwig Elbe; Hermann Arold; Eckart Kranz, and Claus Stölzer, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

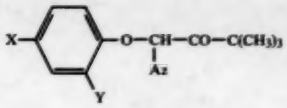
Filed Sep. 8, 1981, Ser. No. 300,071

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3035022

Int. Cl.³ C07D *233/60, 249/08*

U.S. Cl. 548—262 **9 Claims**

1. In the preparation of a phenoxy-azolyl-butanone derivative of the formula



in which

X is a hydrogen atom,

Y is a hydrogen or halogen atom, and

Az is an imidazolyl radical or a 1,2,4-triazolyl radical,

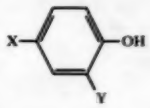
wherein dichloropinacolin of the formula

Cl_2CH—CO—$C(CH_3)_3$

is reacted with an azole of the formula

Az—H

and a phenol of the formula



in the presence of an acid-binding agent, the improvement which comprises carrying out the reaction in the presence of a water-immiscible organic solvent at a temperature between about 40° and 150° C., and without isolation adding to the same water-immiscible solvent at a temperature between about 0° and +80° C. a mineral acid in amount sufficient to precipitate the mineral acid salt of the phenoxy-azolyl-butanone derivative, and separating such salt.

4,388,466

α-HALOMETHYL DERIVATIVES OF AMINO ACIDS

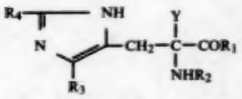
Philippe Bey, Strasbourg, and Michel Jung, Illkirch Graffestaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Division of Ser. No. 819,975, Jul. 28, 1977, Pat. No. 4,315,095. This application Nov. 3, 1981, Ser. No. 317,821

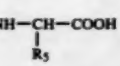
Int. Cl.³ C07D *233/64*

U.S. Cl. 548—337 **5 Claims**

1. A compound of the formula

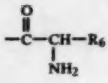


wherein Y is F_2CH—, F_3C—, or Cl_2CH—; each of R_3 and R_4 is hydrogen, halogen selected from fluorine, chlorine, bromine and iodine or a straight or branched lower alkyl group of from 1 to 4 carbon atoms and can be the same or different with the proviso that when both R_3 and R_4 are halogen R_3 and R_4 are the same; R_1 is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, —$NR_{11}R_{12}$ wherein each of R_{11} and R_{12} is hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms or



wherein R_5 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl;

R_2 is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms and is straight or branched or



wherein R_6 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,388,467

CYCLOALKA[4,5]PYRROLO[2,3-G]ISOQUINOLINES

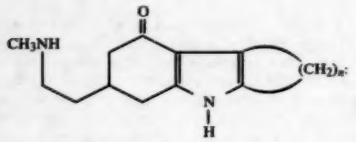
Leo Berger, Montclair, and Gary L. Olson, Westfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 230,765, Feb. 2, 1981, Pat. No. 4,334,070, which is a continuation-in-part of Ser. No. 216,116, Dec. 15, 1980, abandoned, which is a continuation-in-part of Ser. No. 125,604, Feb. 28, 1980, abandoned. This application Mar. 25, 1982, Ser. No. 361,667

Int. Cl.³ C07D *209/88*

U.S. Cl. 548—439 **1 Claim**

1. A compound of the formula



wherein n is 3, 4, 5 or 6.

4,388,468

PROCESS FOR PRODUCING SUBSTITUTED PYRROLES

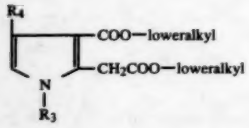
Michael J. Dagani, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 137,511, Apr. 4, 1980, abandoned. This application Aug. 18, 1981, Ser. No. 293,853

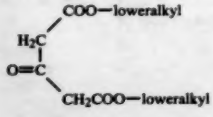
Int. Cl.³ C07D *207/34*

U.S. Cl. 548—531 **11 Claims**

1. In a process for the preparation of a loweralkyl 1,4-diloweralkyl-3-loweralkoxycarbonyl-pyrrole-2-acetate of the formula:



by reacting a mixture of a chloromethyl loweralkyl ketone of the formula: Cl—CH_2—CO—R_4, with a diloweralkyl acetone dicarboxylate of the formula:



and a loweralkylamine of the formula: R_3NH_2, wherein the foregoing formulas said R_3 and said R_4 represent loweralkyl, the improvement consisting essentially of said reaction being carried out in a two-stage procedure according to the steps of

(a) adding said chloromethylloweralkyl ketone to a premixed cooled solution of said loweralkylamine and said dicarboxylate in a suitable solvent with reaction at below 60° C., and

(b) heating the resultant reaction mixture to from about 70° to about 100° C. for a period sufficient to dehydrate the dihydroxy pyrrolidine intermediate in said resultant reaction mixture and produce the desired loweralkyl 1,4-diloweralkyl-3-loweralkoxycarbonyl-pyrrole-2-acetate.

4,388,469

DIPHENYLALKANOETHER AND DIPHENYLALKANONE OXIMEETHER DERIVATIVES

Keiichi Ono, Osaka; Hajime Kawakami, Takarazuka, and Junki Katsube, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

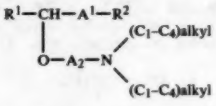
Filed Apr. 2, 1980, Ser. No. 136,565

Claims priority, application Japan, Apr. 2, 1979, 54-40032; Aug. 13, 1979, 54-103340

Int. Cl.³ C07D *333/04;* **C07C** *87/28;* **C07D** *307/34;* **A61K** *31/38, 31/34, 31/135*

U.S. Cl. 549—59 **15 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are each independently a phenyl, thienyl, furyl or naphthyl group optionally substituted with 1 to 3 substituents selected from the group consisting of halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, cyano, di(C_1–C_4)alkylamino, amino, benzyloxy, hydroxyl, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, C_1–C_4 alkanoylamino, C_1–C_4 alkylamino and N-(C_1–C_4)alkyl-N-(C_1–C_4)alkanoylamino, A^1 is a C_3–C_6 alkylene group and A^2 is a C_2–C_4 alkylene group.

4,388,470

CERTAIN SUBSTITUTED CYCLOBUTANE DICARBOXYLIC ACID ANHYDRIDES

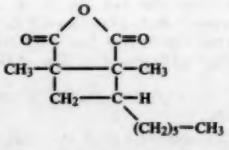
Ellis K. Fields, River Forest, and Ronald L. Anderson, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 27, 1981, Ser. No. 287,156

Int. Cl.³ C07D *307/93*

U.S. Cl. 549—240 **3 Claims**

1. As a composition of matter, the compound of the following structure:



4,388,471

PROCESS FOR THE PREPARATION OF ALKENYL SUCCINIC ANHYDRIDES

Robert H. Wollenberg, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 30, 1982, Ser. No. 373,471
Int. Cl.³ C07C 57/145, 57/15, 69/60; C07D 307/60
U.S. Cl. 549—255 8 Claims

1. In a method for preparing a substituted carboxylic acid or derivative thereof which comprises reacting (A) an alkylating hydrocarbon containing one double bond with (B) at least one of maleic acid, fumaric acid, itaconic acid and anhydrides and esters of any of these acids, at least part of the reaction being conducted thermally, the improvement which comprises conducting said thermal reaction in the presence of a furan-type compound.

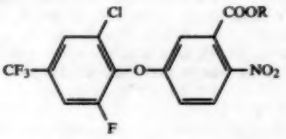
4,388,472

SUBSTITUTED DIPHENYL ETHERS

David Cartwright, Reading, and David J. Collins, Crowthorne, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 168,783, Jul. 14, 1980. This application Jan. 13, 1981, Ser. No. 224,823
Claims priority, application United Kingdom, Jul. 18, 1979, 7925035; Jul. 1, 1980, 8021545
Int. Cl.³ C07C 69/76
U.S. Cl. 560—21 2 Claims

1. A compound of the formula:



wherein R is hydrogen, or an alkyl group of 1 to 6 carbon atoms.

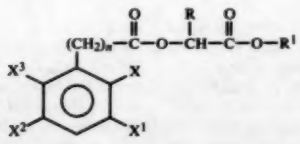
4,388,473

SUBSTITUTED BENZOIC OR PHENYLACETIC ACID ESTERS HAVING PLANT GROWTH REGULATING PROPERTIES

Sidney B. Richter, Fairlawn, and Barry Van Gemert, Massillon, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 29, 1981, Ser. No. 316,256
Int. Cl.³ C07C 69/76
U.S. Cl. 560—65 7 Claims

1. A compound, having plant growth regulating properties, represented by the formula:



wherein,

X is halogen;

X^1 is hydrogen, nitro, or

wherein R^2 and R^3 are the same or different and represent hydrogen, C_1 to C_4 alkyl, alkoxy or haloalkyl or

wherein R^4 is C_1 to C_4 alkyl;

X^2 is halogen;

X^3 is hydrogen, nitro, amino, or C_1 to C_4 alkyl, alkoxy or haloalkyl, provided that either X^1 or X^3 is other than hydrogen;

R is hydrogen or C_1 to C_4 alkyl;

R^1 is hydrogen, C_1 to C_{10} alkyl, haloalkyl or alkoxyalkyl, or an agronomically acceptable ionic species; and

n is 0 or 1.

4,388,474

METHOD FOR THE PREPARATION OF GUANIDINE SULFAMATE

Koichi Tanihara, Ogoori, Japan, assignor to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 6, 1981, Ser. No. 241,236
Claims priority, application Japan, Mar. 6, 1980, 55-29363
Int. Cl.³ C07C 143/837
U.S. Cl. 564—241 3 Claims

1. In a method for the preparation of guanidine sulfamate by a process wherein urea is reacted with ammonium sulfamate under atmospheric pressure or urea is reacted with ammonium sulfamate or diammonium imidosulfonate or triammonium nitrilosulfonate, or more than one of them, in the presence of ammonia under atmospheric pressure, the improvement whereby guanidium sulfamate is separated from the reaction product by a process which comprises the steps of:

(a) Forming an aqueous solution of the reaction product,

(b) Adding hydrolysis product of a preceding run to the solution in an amount effective to promote hydrolysis of the compounds of the reaction products,

(c) heating the solution to a temperature not exceeding 100° C. to give a hydrolysis product mainly composed of guanidinum ions, ammonium ions, hydrogen ions, sulfamate ions and sulfate ions,

(d) Admixing the hydrolysis product in which guanidium ions and sulfamate ions are substantially equal, with CaO or $Ca(OH)_2$, and

(e) Separating the solid components from the liquid containing guanidium sulfamate.

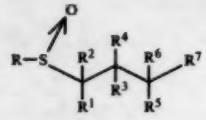
4,388,475

ALLYLSULFOXIDE ENZYME INHIBITORS

Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 66,603, Aug. 15, 1979, abandoned. This application May 7, 1980, Ser. No. 147,659
Int. Cl.³ C07C 147/08; A61K 31/10
U.S. Cl. 564—341 2 Claims

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof wherein,

R is phenyl, either unsubstituted or substituted with

(1) nitro,

(2) o-C_{1-3} alkyl, or

(3) o,o-di(C_{1-3} alkyl),

R^1 is hydrogen;

R^2 and R^5 are hydrogen;

R^3 is a facile leaving group selected from

(a) halo

(b) toluenesulfonyloxy,

(c) benzenesulfonyloxy, and

(d) C_{1-3} alkanesulfonyloxy, or

R^2 and R^3 taken together form a double bond;

R^4 is hydrogen;

R^6 is hydrogen; and

R^7 is $-NH_2$.

4,388,476

HYDROFORMYLATION PROCESS WITH RHODIUM CATALYST AND OXYGEN STABILIZATION THEREOF

James L. Cooper, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1981, Ser. No. 259,399

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—451 **15 Claims**

1. A hydroformylation process comprising contacting at least one alpha or internal olefin of from 2 to 20 carbon atoms in a reaction zone at a temperature of from about 20° C. to about 300° C. and a pressure of from about 15 psig to about 10,000 psig with hydrogen, carbon monoxide and a catayst consisting essentially of unmodified rhodium for a sufficient period of time to produce aldehyde product, treating reactor effluent with an oxygen containing gas, and separating said product from said effluent in a distillation zone at a temperature of about 120° C. or less to leave a base product containing a rhodium salt of a carboxylic acid.

4,388,477

HYDROFORMYLATION PROCESS EMPLOYING UNMODIFIED RHODIUM-COBALT CATALYST

James L. Cooper, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 2, 1981, Ser. No. 269,094

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—451 **6 Claims**

1. A hydroformylation process comprising contacting at least one olefin having from 2 to 20 carbon atoms in a reaction zone at a temperature of from about 60° C. to about 250° C. and a pressure of from about 750 psig to about 10,000 psig with hydrogen, carbon monoxide, and a catalyst consisting of a mixture of unmodified cobalt and unmodified rhodium in a molar ratio of from about 0.5 to about 100, wherein for each mole of olefin there is present from about 1×10^{-7} to about 1×10^{-4} moles of cobalt and from about 1×10^{-7} to about 1×10^{-5} moles of rhodium, for a sufficient period of time to permit reaction of said olefin with said carbon monoxide and hydrogen to form aldehyde product.

4,388,478

PROCESS FOR THE ORTHO-ALKYLATION OF PHENOLIC COMPOUNDS

Akihide Kudoh; Motoo Kawamata; Kazushi Ohshima; Makoto Kotani, all of Yokohama; Takeshi Tsuda, Kanagawa, and Fukuichi Aoki, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Oct. 30, 1981, Ser. No. 316,800

Claims priority, application Japan, Nov. 17, 1980, 55-160686

Int. Cl.³ C07C *37/16*

U.S. Cl. 568—804 **6 Claims**

1. In a process for the selective ortho-alkylation of a phenolic compound having at least one ortho-positioned hydrogen atom by catalytically reacting the phenolic compound with a saturated aliphatic alcohol having from 1 to 4 carbon atoms in the vapor phase at a temperature of from 300° C. to 550° C., the improvement of which comprises carrying out the reaction in the presence of a catalyst containing manganese oxide and one or more additives selected from group (A) consisting of germanium oxide, tin oxide and lead oxide, said additives selected from the group (A) are present in such proportion as to provide an atomic ratio of manganese to said additives ranging from 100:0.1 to 100:50.

4,388,479

PROCESS FOR PRODUCING C_4-C_{10} ETHYLENE ALCOHOLS

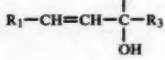
Vladimir M. Gryaznov, Lomonosovsky prospekt, 14, kv. 504; Andrei N. Karavanov, ulitsa Fabritsiusa, 20, kv. 29; Tamara M. Belosljudova, ulitsa Konenkova, 11, kv. 60, all of Moscow; Anatoly V. Ermolaev, poselok Shvarts, ulitsa Mendeleeva 7, kv. 54, Tulskaya oblast; Anatoly P. Maganjuk, Yasenevo, 9 mikroraion, 73, kv. 540, and Irina K. Sarycheva, ulita Baumanskaya, 62, kv. 85, both of Moscow, all of U.S.S.R.

Filed Apr. 9, 1981, Ser. No. 252,307

Int. Cl.³ C07C *29/17*

U.S. Cl. 568—828 **4 Claims**

1. A process for producing C_4-C_{10} ethylene alcohols of the formula:



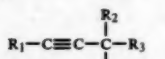
(I)

wherein

(a) R_1 is $-CH_2OH$, R_2=R_3=—H;

(b) R_1 is —H, R_2 is $-CH_3$, R_3 is a radical selected from the group consisting of $-CH_3$ and $-C_6H_{11}$

comprising hydrogenation of acetylene alcohols of the formula:



(II)

wherein

(a) R_1 is $-CH_2OH$, R_2=R_3=—H;

(b) R_1 is —H, R_2 is $-CH_3$ and R_3 is a radical selected from the group consisting of $-CH_3$ and $-C_6H_{11}$

in the form of technical products in the liquid phase on a membrane catalyst made of an alloy consisting of palladium and ruthenium at a mass ratio therebetween of 90–94:10–6 respectively; hydrogenation of said alcohols is effected by means of hydrogen diffusing through the membrane catalyst at a temperature of from 60° to 180° C. and atmospheric pressure of hydrogen.

4,388,480

PROCESS FOR PREPARING 4-METHYL-1-PENTENE

Hirosuke Imai, Yokohama; Mitsuo Matsuno, Kawasaki, and Michio Kudoh, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jan. 7, 1982, Ser. No. 337,775

Claims priority, application Japan, Jan. 27, 1981, 56-9579

Int. Cl.[3] C07C *3/02, 3/20*

U.S. Cl. 585—516 6 Claims

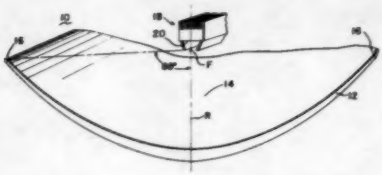
1. A process for the preparation of 4-methyl-1-pentene which consists of dimerizing propylene at a temperature of 100° C.–250° C. in the presence of a catalyst consisting of at least one compound selected from the group consisting of sodium and sodium amide supported on a carrier of formula

$$K_2O.xAl_2O_3$$

wherein x has a value in the range of $0.5 \leqq x \leqq 11$, said carrier being prepared by heating at 400°–2000° C., a mixture of K_2O or a compound capable of forming K_2O and Al_2O_3 or a compound capable of forming Al_2O_3 at said temperature of 400°–2000° C.

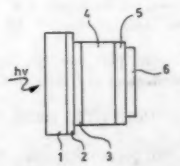
ELECTRICAL

4,388,481
CONCENTRATING PHOTOVOLTAIC SOLAR COLLECTOR
Miroslav Uroshevich, Cincinnati, Ohio, assignor to Alpha Solarco Inc., Cincinnati, Ohio
Filed Jul. 20, 1981, Ser. No. 284,649
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—246 **17 Claims**



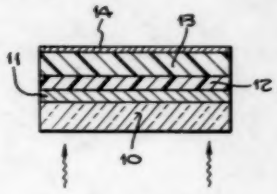
1. A concentrating photovoltaic solar collector comprising:
a reflector having a generally concave cross sectional configuration positionable to receive solar radiation and concentrate it at a focus, said reflector being symetrical with respect to a reference line extending from said focus to said reflector, said reflector further having a sufficiently deep curvature that solar rays striking portions of the reflector farthest from said reference line are reflected to said focus at an angle of close to 90° with respect to said reference line;
photovoltaic cell means positioned along said line so that the energy receiving surface of said cell means is substantially normal to said reference line and facing said reflector, said cell means being positioned so that the focus is between the cell means and the reflector; and,
reflector means extending from adjacent said cell means towards said reflector and having a cross sectional configuration generally defining an acute angle with respect to the energy receiving surface of said cell means for re-reflecting solar rays from adjacent the limits of said reflector onto said cell means for uniform solar energy distribution across said surface.

4,388,482
HIGH-VOLTAGE PHOTOVOLTAIC CELL HAVING A HETEROJUNCTION OF AMORPHOUS SEMICONDUCTOR AND AMORPHOUS SILICON
Yoshihiro Hamakawa, 3-17-4, Minami-Hanayashiki Kawanishi, Hyogo, and Yoshihisa Tawada, 14-39, Oike-Miyamadai, Kita-Ku, Kobe, Hyogo, both of Japan
Filed May 19, 1981, Ser. No. 266,064
Claims priority, application Japan, Jan. 29, 1981, 56-12313; Feb. 17, 1981, 56-22690; Apr. 30, 1981, 56-66689
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—258 **13 Claims**



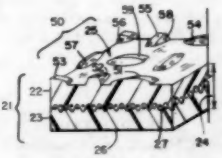
1. A p-i-n amorphous silicon type photovoltaic cell, characterized by incorporating as either the p or n type side thereof exposed to the incident light an amorphous semiconductor having an optical band gap, Eg.opt, of not less than about 1.85 eV, an electric conductivity of not less than about 10^{-8} $(\Omega.cm)^{-1}$ at 20° C. and a p-i-n junction diffusion potential, Vd, of not less than about 1.1 volts.

4,388,483
THIN FILM HETEROJUNCTION PHOTOVOLTAIC CELLS AND METHODS OF MAKING THE SAME
Bulent M. Basol; Eric S. Tseng, and Robert L. Rod, all of Los Angeles, Calif., assignors to Monosolar, Inc., Santa Monica, Calif.
Filed Sep. 8, 1981, Ser. No. 300,116
Int. Cl.³ H01L *31/06, 31/18;* C25D *5/50, 9/04*
U.S. Cl. 136—260 **7 Claims**



6. A thin film heterojunction photovoltaic cell formed by (a) electrodepositing a layer of a thickness of about 0.02 to 0.05 microns of a semiconductor compound formed of at least one of the metal elements of Class II B and one of the non-metal elements of Class VI A of the Periodic Table of Elements, (b) electrodepositing on said layer a film of a near intrinsic or n-type semiconductor compound different from the layer semiconductor compound and formed of at least one of the metal elements of Class II B of the Periodic Table of Elements and at least tellurium and (c) heating said film at a temperature between about 250° and 500° C. for a time sufficient to convert said film to a suitably low-resistivity p-type semiconductor compound.

4,388,484
OIL FIELD MATS
Gerald O. York, 623 Gardner St., Borger, Tex. 79007
Filed Oct. 2, 1981, Ser. No. 307,794
Int. Cl.³ H01B *17/64*
U.S. Cl. 174—5 R **8 Claims**



1. A protective mat comprising an oil-resistant elastomer with d.c. proof test voltage in excess of 70,000 volts comprising the formulation of 1503 type rubber, a cold polymerized styrene butadiene with a fatty acid emulsifier formed by acid coagulation, 23.5% target bound styrene, with a nominal Mooney viscosity of 52 (ML 1+4) 212° F. and is non staining (80 parts); CIS-4-1203, a solution butadiene dry rubber with CIS content of 93% and having a nominal Mooney viscosity (ML 1+4, 100° C.) of 45 (20 parts); Ca CO3 (25 parts); Mineral Rubber (50 parts); Zinc Oxide (10 parts); Stearic acid (1 part); Octamine (1 part); Sunproof wax (2 parts); PbO (2 parts); 90% of the zinc salt of 2-mercapto-benzo thiazole and 10% hydrocarbon wax (2½ parts); tetramethyl thiuram monosulphide (2.3 parts); and Sulfur (1.8 parts); which material provides a scorch test of 9.5 minutes at 280° F. and has a Shore A hardness of 56.

4,388,485

LONGITUDINALLY WATER-TIGHT CABLES

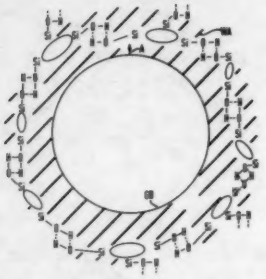
Guenter Zeidler, Germering; Ernst Ney, Krailling; Gerhard Lange, and Helmut Saller, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 24, 1981, Ser. No. 247,078

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012206

Int. Cl.³ B32B *9/00, 15/00;* G02B *5/16;* H02G *15/20*

U.S. Cl. 174—23 C 6 Claims



1. In a longitudinally water-tight communication cable structure having at least one signal-carrying element therein and a jacket for closing the interior of such structure off from the outside and having in its interior a filling material containing a water-repellent substance and relatively small-diameter gas bubbles embedded in such filling material, the improvement wherein:

said filling material contains a reticulating thixotropic substance characterized by a 3-dimensional network-like structure formed by hydrogen bridges and which is disruptable under mechanical influence and is regenerable over a time span in a motionless state, with a significant increase of viscosity, said thixotropic substance being an oxide selected from the group consisting of B_2O_3, P_2O_5 and GeO_2, and being compounded with water; and

said gas bubbles being of a size relative to the resistance to disruption of said network-like structure so that the buoyancy of such gas bubbles in said filling material is significantly below the resistance to disruption in the motionless state of the filling material so that such relatively small diameter gas bubbles are maintained at their respective positions in said filling material in a time-stable manner during a motionless state.

4,388,486

SHIELDED LINE

Hisayoshi Nakatsuka, Mitaka, Japan, assignor to Namiki Precision Jewel Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1981, Ser. No. 251,890

Claims priority, application Japan, Apr. 25, 1980, 55-057225[U]

Int. Cl.³ H01B *11/06*

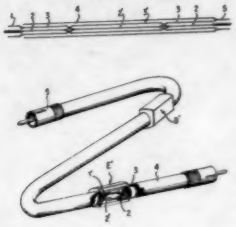
U.S. Cl. 174—34 4 Claims

1. A shielded line comprising

a inner wire having first and second ends;

a shielding conductor disposed around the inner wire, said shielding conductor having first and second ends where the shielding conductor including the first and second ends there is electrically insulated from the inner wire including the first and second ends thereof; and

said inner wire and shielding conductor being divided into first, second and third parts where (a) the inner wires of the first and third parts are connected to the shielding conductor of the second part and (b) the inner wire of the second part is connected to the shielding conductors of the first and third parts so that a signal applied to the inner wire of the first part flows through the inner wire of the first part, the shielding conductor of the second part and the inner wire of the third part and a signal applied to the



shielding conductor of the first part flows through the shielding conductor of the first part, the inner wire of the second part and the shielding conductor of the third part and where the effective length of the first and third parts is substantially equal to that of the second part.

4,388,487

ARRANGEMENT FOR PREVENTING THE FORMATION OF A FOREIGN LAYER ON A HIGH-VOLTAGE INSULATOR

Edmond Petrossian-Avakian, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 23, 1981, Ser. No. 333,914

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1981, 3102613

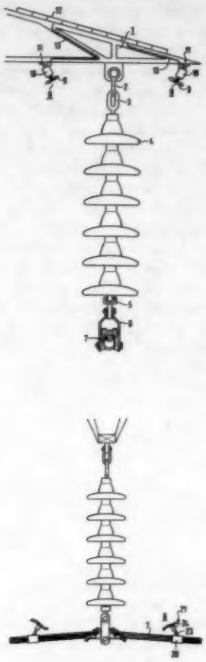
Int. Cl.³ H01B *17/52;* H02G *7/00*

U.S. Cl. 174—40 R 4 Claims

1. An arrangement for preventing the formation of a foreign layer on a high-voltage insulator which is at least partially exposed, the arrangement comprising fan means having an exposed fan blade disposed in the vicinity of the high-voltage insulator, said fan means being arranged to cover the exposed portion of the high-voltage insulator with an air stream.

4. The arrangement of claim 1 wherein said fan means is of a motorless type, and is attached to high-voltage carrying parts

of a network, said fan blade having electrically conducting points, said electrically conducting points driving said fan



blade to rotation by generating and repelling ions, in accordance with a point-effect principle.

4,388,488

SEALING SYSTEM FOR A LONGITUDINALLY DIVIDED CABLE FITTING ELEMENT

Rudolf Wicek, Haar, and Dieter Kunze, Neuried, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

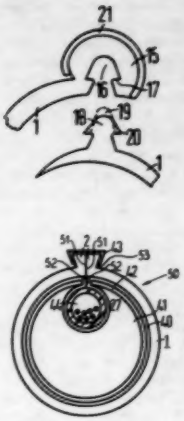
Filed Sep. 8, 1980, Ser. No. 184,989

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939241

Int. Cl.³ H02G *15/18, 3/04*

U.S. Cl. 174—92 **9 Claims**

1. A sealing system for a longitudinally divided cable fitting element of heat shrinkable material having a longitudinally extending opening, said sealing system comprising a longitudinally extending clamp portion being integrally formed on one side of the opening of the fitting element, said clamp portion having a longitudinally extending groove with undercuts forming shoulders, a longitudinally extending head portion being disposed on the other side of the opening of said fitting element and having undercuts, said clamp portion receiving the bead portion to form a seal of the opening with the undercuts engaging the shoulders to form a snap fit, one of said bead and clamp portions being substantially rigid and unaffected by heat, the other of said bead and clamp portions having a permanent shape which is tightly engaged with said one portion to form the seal, said other portion being deformed from the permanent shape to a temporary shape to enable easy assembly of the portions and returning to said permanent shape when the fitting element is heated to an elevated temperature for a



shrinking process so that the portions are easily assembled to close the opening and then treated to create a tight sealing fit.

4,388,489

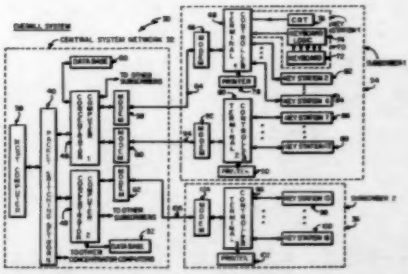
CONVERSATIONAL VIDEO SYSTEM

Jack G. Wigan; David G. Ure, both of London, and John M. Richards, Blewbury, all of England, assignors to Reuters Limited, London, England

Filed Jan. 30, 1981, Ser. No. 230,341

Int. Cl.³ G06F *15/20;* **H04Q** *11/04;* **G11B** *27/10*

U.S. Cl. 178—3 **23 Claims**



1. In a video communication network capable of providing textual data messages to a plurality of subscriber terminals throughout said network, at least a portion of said plurality of subscriber terminals comprising keystations, each of said keystations comprising a keyboard means for inputting textual data messages and associated data control signals to said network and a video display means for providing a textual video display of at least keyboard generated data input to said network; the improvement comprising at least one message switching node interface means for routing video conversational textual data messages throughout said network and a plurality of keystation terminal controller interface means operatively connected between said keystations and said one message switching node interface means with at least one keystation being operatively connected to one keystation terminal controller interface means for each of said plurality of

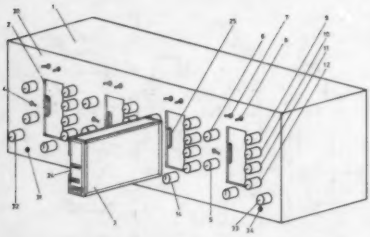
keystation terminal controller interface means, said one message switching node interface means comprising message routing logic means and storage means operatively connected to said message routing logic means for providing message routing logic control signals, each of said keystation controller interface means comprising display control logic means and local video display storage means for locally storing video conversational textual data for providing a video display thereof to at least one of said keystations connected to said keystation controller interface means, said keyboard means comprising means for providing unique calling signals to said keystation controller interface means for initiating calls to a keystation designated portion of said plurality of keystations in said network, said keystation controller interface means comprising means for providing said calling signals to said message switching node interface means and for receiving said calling signals therefrom for completing a call to said one connected keystation, said message routing logic means comprising means for routing said calling signals to said designated keystations to complete said initiated calls, said display control logic means comprising means for providing on said one connected keystation video display means a substantially simultaneous video display of video conversational textural data received from two different designated keystations in said network with which calls are completed via said separate keyboard means associated with said two different designated keystations and transmitted to said two different designated keystations via said keyboard means associated with said one connected keystation, whereby different video conversations may be substantially simultaneously carried out with different keystations on a common video display using a common keyboard.

4,388,490

EFFECTS BOX SYSTEM AND METHOD

Abner Spector, 1710 Avenida Del Mundo #803, Coronado, Calif. 92118

Filed May 19, 1980, Ser. No. 150,813
Int. Cl.³ H04R *3/12*
U.S. Cl. 179—1 B **3 Claims**



1. A system for noiselessly operatively inserting at least one audio effects circuit module into a main audio path having a source audio signal without introducing spurious noise signals, while maintaining continuity of the audio path, comprising:

(a) an audio effects circuit module which provides audio effects, said audio effects circuit module having module contact elements including at least one input terminal and at least one output terminal, wherein said output terminal provides the audio effects;

(b) a main housing having a main input terminal for connecting a main incoming source audio signal to the audio path and having a main output terminal, said main housing further having at least one recess for receiving said audio effects circuit module, said recess having recess contact elements mounted and positioned thereon to make corresponding contact with said module contact elements when said module is fully inserted into said recess;

(c) first switching means associated with the audio path and with said recess contact elements for maintaining the continuity of the audio path when said recess is devoid of said audio effects circuit module; and

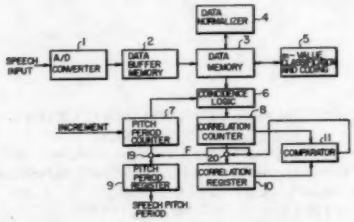
(d) second switching means associated with the audio path and with said recess contact elements, said second switching means being responsive to partial insertion of said audio effects circuit module into said recess for electrically disconnecting said recess contact elements from the audio path, while maintaining continuity of the audio path, so that the first physical contact between said module contact elements and said corresponding recess contact elements is made remote from the audio path, said second switching means further being responsive to full insertion of said audio effects circuit module for electrically connecting said recess contact elements to the audio path only after physical and electronic contact between said module contact elements and said corresponding recess contact elements has been solidly made, for noiselessly operatively connecting said module input and output to the audio path thereby inserting said audio effects circuit module into the audio path without introducing spurious noise signals.

4,388,491

SPEECH PITCH PERIOD EXTRACTION APPARATUS

Yoshihiro Ohta, Yokohama, and Akira Ichikawa, Musashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 26, 1980, Ser. No. 191,291
Claims priority, application Japan, Sep. 28, 1979, 54-124052
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SC **11 Claims**



1. A speech pitch period extracting apparatus comprising:

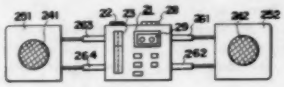
(a) classifying and coding means for classifying and coding the amplitude value of a plurality of successive samples of a speech waveform into at least three values of coded data on the basis of predetermined threshold values;

(b) code-coincidence determining means for detecting when coincidence occurs between selected code values of data thus classified and coded by said classifying and coding means; and

(c) code-coincidence counting means for counting the times of coincidence between data signals separated by a predetermined time interval in response to said code coincidence determining means; and

(d) pitch deciding means responsive to said code-coincidence counting means for determining that time interval which provides the maximum number of code coincidences between data signals, thereby determining the speech pitch period.

4,388,492
MINIATURE STEREO DEVICE WITH EXTENSIBLE SPEAKERS
Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan
Filed Nov. 26, 1980, Ser. No. 210,598
Claims priority, application Japan, Mar. 7, 1980, 55-28778
Int. Cl.³ H04R 5/02
U.S. Cl. 179—1 GA **8 Claims**



1. A minature stereo device comprising an audio device which generates a stereo output, said audio device including a main body, a pair of speakers positioned at both sides of said main body and facing in a forward direction relative to said main body for reproducing said stereo output and directing the reproduced stereo output in the forward direction, and extensible means fixed to said main body and to at least one of said pair of speakers for enabling said at least one speaker to be adjustably linearly moved in the direction perpendicular to the forward direction between a minimum separation and a maximum separation and to be held at a desired position whereat the speaker is linked to but separated from the other speaker for obtaining an optimum stereo effect.

4,388,493
IN-BAND SIGNALING SYSTEM FOR FM TRANSMISSION SYSTEMS
Douglas A. Maisel, 2412-6th St., Berkeley, Calif. 94710
Filed Nov. 28, 1980, Ser. No. 211,307
Int. Cl.³ H04H 5/00
U.S. Cl. 179—1 GD **22 Claims**

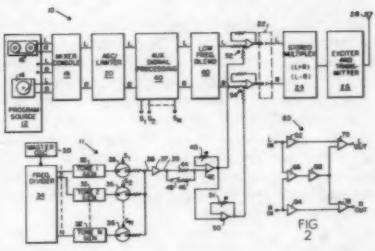
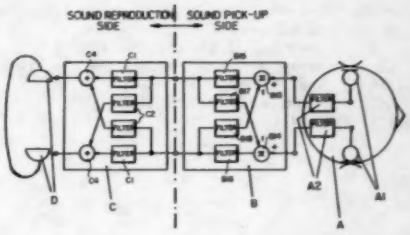


FIG 2

1. In a stereo transmission system for generating and transmitting an FM multiplex signal derived from left and right audio frequency stereo channels, said multiplex signal including a sum channel containing the summed left and right stereo channel signals and a difference channel containing the difference between said left and right stereo channel signals, an in-band signaling system comprising:
- means for generating at least one low frequency audio tone;
- means for generating from each said audio tone first and second component signals, said first component signal being substantially of equal amplitude and 180° out of phase with said second component signal; and
- summing means for summing each said first component signal with said left stereo channel and for summing each said second component signal with said right stereo channel such that when FM multiplexed, each said tone appears substantially only on said difference channel.

11. An automatic tone detecting apparatus for receiving a transmitted FM stereo multiplex signal containing at least one low frequency audio tone modulated substantially only on the 38 kHz subcarrier of said FM stereo signal, comprising:
- means for detecting the existence of each said low frequency tone on said 38 kHz subcarrier; and
- means responsive to said tone detection for activating an auxiliary circuit, said auxiliary circuit remaining activated so long as said tone continues to be detected by said tone detector means.

4,388,494
PROCESS AND APPARATUS FOR IMPROVED DUMMY HEAD STEREOPHONIC REPRODUCTION
Peter Schöne, No. 13, Rosenstrasse, 8011 Aschheim; Jürgen Ölmann, No. 5, Davidstrasse, 8000 Munich 89, and Helmut Lamparter, No. 36, Rosenstrasse, 8011 Kirchheim, all of Fed. Rep. of Germany
Filed Jan. 5, 1981, Ser. No. 222,475
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1980, 3001007; Feb. 2, 1980, 3003852
Int. Cl.³ H04S 1/00
U.S. Cl. 179—1 G **11 Claims**

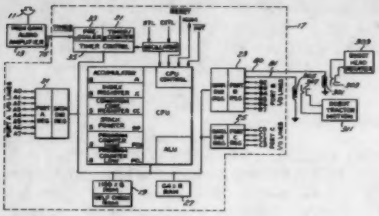


1. A process for stereophonic transmission of sound signals, comprising the steps of:
- (a) providing a dummy head containing two microphone arrangements for simulating directional hearing with respect to a human listener;
- (b) feeding output signals from said microphone arrangements to two filters each having a frequency response inverse with respect to the free-field transfer constants of said microphone arrangements for providing filter output signals which are independent of frequency; and
- (c) feeding said filter output signals to a decoupling arrangement having transfer functions determined from said free-field transfer constants of said dummy head containing said microphone arrangements for producing space-related stereophonic signals containing directional information items.

4,388,495
SPEECH RECOGNITION MICROCOMPUTER
Myron H. Hitchcock, Englewood, Colo., assignor to Interstate Electronics Corporation, Anaheim, Calif.
Filed May 1, 1981, Ser. No. 259,695
Int. Cl.³ G10L 1/00
U.S. Cl. 179—1 SD **20 Claims**

6. A speech recognition system, comprising:
- a read-only memory permanently storing speech template data for a limited vocabulary, said speech template data defining words selected to be dissimilar;
- means for analyzing speech input data, said means comprising:
  - means for measuring the average speech frequency of said data;
  - means for comparing said average speech frequency with thresholds to generate speech state sequences of fricative-like, vowel-like, and silence states; and
  - means for changing at least one of said thresholds in re-

sponse to a previous state of said speech state sequence; and



means for comparing said speech state sequences with said speech template data to output a signal identifying said speech.

4,388,496

FM/AM STEREO RECEIVER

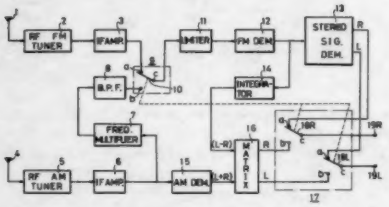
Yukihiko Miyamoto, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1981, Ser. No. 291,968

Claims priority, application Japan, Aug. 11, 1982, 55-113543[U]; Aug. 11, 1982, 55-113544[U]

Int. Cl.³ H03D *3/22*; H04H *5/00*

U.S. Cl. 179—1 GS **8 Claims**



1. An FM/AM stereo receiver comprising:

an RF FM stereo tuner for selecting and converting an RF FM stereo signal into an IF FM stereo signal;

an IF FM stereo amplifier for amplifying the IF FM stereo signal from the RF FM stereo tuner;

an RF AM stereo tuner for selecting and converting an RF AM stereo signal of an AM-PM system into an IF AM stereo signal;

an IF AM stereo amplifier for amplifying the IF AM stereo signal from the RF AM stereo tuner;

a frequency multiplier for frequency multiplying the IF AM stereo signal from the IF AM stereo amplifier to obtain a frequency-multiplied IF AM stereo signal the non-phase-modulated carrier frequency of which is equal or close to a non-frequency-modulated carrier of the IF FM stereo signal from the IF FM stereo amplifier;

FM/AM stereo signal selecting means for selecting the IF FM stereo signal from the IF FM stereo amplifier and the frequency-multiplied IF AM stereo signal from the frequency multiplier;

a limiter for amplitude limiting the IF FM stereo signal from the FM/AM stereo signal selecting means and amplitude limiting the frequency-multiplied IF AM stereo signal from the FM/AM stereo signal selecting means to obtain a frequency-multiplied IF PM difference signal;

an FM demodulator for frequency demodulating the IF FM stereo signal from the limiter into a composite stereo signal and frequency demodulating the frequency-multiplied IF PM difference signal from the limiter to obtain an IF demodulated PM difference signal;

a stereo signal demodulator for deriving left and right signals from the composite stereo signal provided from the FM demodulator;

an integrator for integrating the IF demodulated PM difference signal from the FM demodulator to obtain a difference signal;

an AM demodulator for amplitude demodulating the IF AM stereo signal from the IF AM stereo amplifier to obtain a sum signal; and

a matrix circuit for deriving left and right signals from the sum signal and the difference signal provided from the AM demodulator and the integrator, respectively.

4,388,497

TELEPHONE POWER SUPPLY ARRANGEMENT

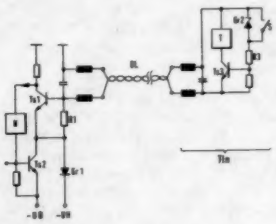
Hartmut Scheffler, Aspach, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 239,101

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1980, 3007468

Int. Cl.³ H04M *19/00*

U.S. Cl. 179—77 **10 Claims**



1. In a circuit for supplying power to a subscriber telephone device connected to a central office via a two-wire line, which circuit includes a main power supply at the central office and switching means at the telephone device actuatable to place the device in operation and to connect an electrical load in circuit across the line, the improvement comprising: an auxiliary power supply disposed at said central office and connected across said line when said telephone device is not in operation; and circuit means connected for selectively connecting said main power supply to said line when said telephone device is in operation.

4,388,498

VOLTAGE STABILIZER SUITABLE FOR USE IN A TELEPHONE SET

Josephus J. A. Geboers, and Daniel J. G. Janssen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1980, Ser. No. 191,102

Claims priority, application Netherlands, Oct. 1, 1979, 7907276

Int. Cl.³ H04M *1/00*

U.S. Cl. 179—81 R **1 Claim**

1. A voltage stabiliser suitable for a telephone set comprising:

first and second terminals,

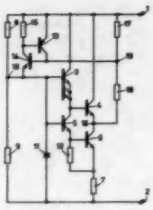
first and second resistors,

a first transistor having a first current path which is coupled between said first and second terminals by means of said first and second resistor,

a first voltage divider connected between said terminals, a first tap of said first voltage divider being connected to the base of said first transistor,

a capacitor connected between the base of said first transistor and said second terminal to which the emitter of said first transistor is also coupled through said first and second resistors,

a second transistor having a second current path connected in series with said second resistor and said first and second terminals, the base of said second transistor being connected to the junction of the emitter of said first transistor and said first resistor,



a third resistor,

a thyristor having an anode gate and a cathode gate, said anode gate being connected through said third resistor to said first terminal and to the base of said first transistor by means of the emitter terminal of said thyristor, and

a second voltage divider having a tap connected to said cathode gate of said thyristor, said second voltage divider being connected between said first terminal and the collector terminal of said second transistor.

4,388,499

LINE INTERRUPTION CIRCUIT FOR USE IN A TELEPHONE SET

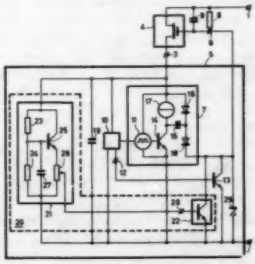
Daniël J. G. Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1981, Ser. No. 234,086

Claims priority, application Netherlands, Feb. 26, 1980, 8001136

Int. Cl.³ H04M *1/44*

U.S. Cl. 179—81 R **5 Claims**



1. A line interruption circuit for use in a telephone set for producing electronically generated dial pulses comprising:

a semiconductor switching element connected between a first terminal and a connecting point,

a control circuit connected between said connecting point and a second terminal, a control electrode of said semiconductor switching element being coupled to said control circuit for rendering said semiconductor element non-conductive during the presence of each control pulse produced by said control circuit and for rendering said semiconductor switching element conductive in the absence of a control pulse, said control circuit comprises a current detection device for driving said semiconductor switching element into saturation during the absence of a dial pulse when the line current is below a predetermined value and for driving said semiconductor switching element out of saturation when the line current is above the said predetermined value.

4,388,500

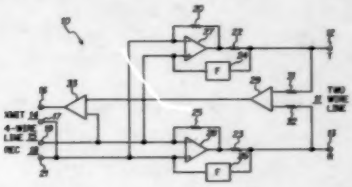
ELECTRONIC HYBRID

John F. Regan, Lombard, Ill., assignor to Wescom, Inc., Downers Grove, Ill.

Filed Feb. 27, 1981, Ser. No. 239,061

Int. Cl.³ H04B *1/58*

U.S. Cl. 179—170 NC **9 Claims**



1. In an electronic hybrid having a two wire port for coupling to a two wire line, separate transmit and receive ports for coupling to a four wire line, driving means responsive to signals imposed on the receive port for driving the two wire line including a pair of amplifiers each having an input responsive to signals imposed on said receive port and an output, means responsive to signals imposed on the two wire port for transmitting said signals to the transmit port, means for preventing signals imposed on the receive port and coupled to the two wire port from being returned to the transmit port, an impedance serially connected between each amplifier output and the two wire port, the driving means including means for providing an ac ground at the junction between each amplifier output and its associated impedance and the driving means being biased to supply dc current to the two wire line through the impedances, the improvement comprising said serially connected impedances having an aggregate value of less than half of the desired terminating impedance of the hybrid, and feedback means connected from the junction between each impedance and the two wire port to an input of each amplifier for providing positive feedback for each amplifier whereby the output impedance of the hybrid attributable to the aggregate of the serially connected impedances increased.

4,388,501

AUDIO-VISUAL LINE TEST TERMINATION DEVICE

Omprakash G. Ahuja, East Meadow, N.Y., assignor to TII Industries Inc., Copiague, N.Y.

Filed May 11, 1981, Ser. No. 262,456

Int. Cl.³ H04B *3/46*; H04M *1/26*

U.S. Cl. 179—175.3 R **8 Claims**

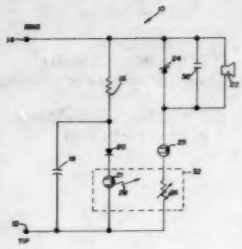
1. A varying impedance line test termination device for providing a characteristic signature to the telephone central office and an audio-visual indication at a subscriber termination when a continuity test is made on a subscriber line having a pair of electrically conductive paths comprising:

(a) a first current path having a first resistor and a first capacitor connected in series, said serially connected first resistor and said first capacitor being connected across said electrically conductive line paths;

(b) a diode and a first light emitting voltage breakover means connected in series, said serially connected diode and said first light emitting voltage breakover means being connected across said capacitor; and

(c) a second current path having an audio indicator means, a second light emitting voltage breakover means and a light dependent resistor being disposed proximate said first light emitting breakover means to receive light rays ema-

nating therefrom, said audio indicator means, and said second light emitting voltage breakover means being



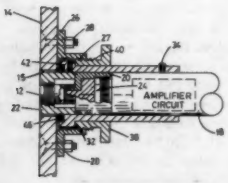
connected in series across said electrically conductive line paths.

4,388,502

ADAPTER FOR MOUNTING A MICROPHONE FLUSH WITH THE EXTERNAL SURFACE OF THE SKIN OF A PRESSURIZED AIRCRAFT

Robert B. Cohn, Lancaster, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 14, 1981, Ser. No. 330,613
Int. Cl.³ H04R 1/02
U.S. Cl. 179—179 **7 Claims**



1. In a mounting device for mounting a sonic transducer comprising a microphone pick-up head flush with respect to the external surface of the skin of an aircraft for detecting shock waves passing thereover, the improvement comprising:

A. a segmented, cylindrical body defining a housing for an electronic package having a base segment and a distal segment characterized by a substantially planar end surface and including a concentric aperture, an amplifier circuit and a microphone pick-up head confined within said housing, said pick-up head being projected into said aperture and characterized by a planar end surface arranged in coplanar relation with the end surface of said cylindrical housing; and

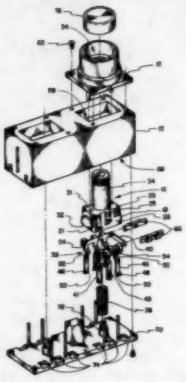
B. mounting means for securing said housing within a pressurized compartment for an aircraft with the planar end surface of said housing disposed in coplanar relation with the external surface of the skin of the aircraft, said mounting means including a mounting sleeve having an internal surface of a cylindrical configuration for receiving said housing in adjustable, telescopic relation, means for securing said sleeve in fixed relation with said housing, and means for affixing said sleeve to the internal surface of the skin of an aircraft.

4,388,503

MULTIPLE POSITION PUSHBUTTON SWITCH

William D. Penland, Weaverville, and Harold F. Loew, Asheville, both of N.C., assignors to Square D Company, Palatine, Ill.

Filed Aug. 14, 1981, Ser. No. 292,776
Int. Cl.³ H01H 13/70
U.S. Cl. 200—5 R **13 Claims**



1. A multiple position electric pushbutton switch comprising;

a movable cam,

a movable contact assembly having at least two electrically and physically interconnected spring elements with each element having an electric contact portion and a cam engaging portion,

at least two stationary contacts with each stationary contact engagable with one of the contact portions,

a housing containing the cam, the movable contact assembly and the stationary contacts and

at least two cam surfaces on the cam with each cam surface engagable with one of the cam engaging portions, said cam surfaces having a location on the cam so a first of said surfaces engages a cam portion on a first of the spring elements upon movement of the cam to a first position in the housing and a second of the cam surfaces engages a cam portion on a second of the spring elements upon movement of the cam from the first position to a second position in the housing.

4,388,504

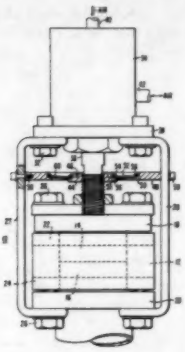
SWITCH OPERATING MEANS INCLUDING LATCHING MEANS MAINTAINING SWITCH CONTACTS OPEN OR CLOSED

Robert M. Hruda, and John L. Cusimano, both or Horsebeads, N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 24, 1981, Ser. No. 276,766
Int. Cl.³ H01H 15/18
U.S. Cl. 200—76 **3 Claims**

1. An improved operating mechanism for a low DC voltage, high continuous current electrical shunting switch which comprises a hermetically sealed switch body, with reciprocably movable switch contacts extending through opposed portions of the switch body, which operating mechanism includes reciprocating actuating means connected to one of the switch contacts for moving the switch contact toward and away from the other switch contact within the switch body to a closed contact position and an open contact position, the improvement comprising a latching means connected between the reciprocating actuating means and a rigid mounting means, which latching means maintains the switch contacts in either

the closed contact position or open contact position until predetermined force is applied via the reciprocating actuating means to overcome the latch condition and permit movement of the switch contact, and wherein the latching means comprises a Belleville type washer, the outer perimeter of which is rigidly retained by rigid mounting means, and the inner perimeter of which is connected to the reciprocating actuating



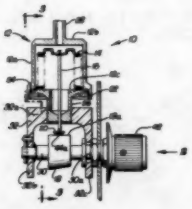
means and is movable therewith from a latched open contact position to a latched closed contact position, and wherein the reciprocating actuating means includes a threaded drive rod connected to one switch contact, and an adjustable inner anchor means is threaded onto the drive rod, with the inner perimeter of the Belleville type washer retained by the adjustable inner anchor means.

4,388,505

ADJUSTABLE PRESSURE-ACTUATED SWITCH

Grigor Sarian, Los Angeles, and Dee J. Neville, Simi Valley, both of Calif., assignors to Puritan-Bennett Corp., Kansas City, Mo.

Filed Feb. 9, 1981, Ser. No. 232,839
Int. Cl.³ H01H *35/32*
U.S. Cl. 200—83 C **17 Claims**



1. An adjustable pressure-actuated switch, comprising:

a pressure chamber connected to a source of pressure to be use in actuating said switch;

diaphragm means disposed in said pressure chamber and exposed on one side to the pressure in said chamber;

a first electrical contact affixed to said diaphragm means and movable therewith along a path;

a second electrical contact disposed in the path of movement of said first electrical contact;

pressure selection means for adjusting the relative spacing between said first and second electrical contacts, to allow for their closure at a selected pressure;

first calibration means, for adjusting the relative spacing between said first and second electrical contacts when said pressure selection means is set at a first pressure setting and a first reference pressure is applied to said pressure chamber; and

second calibration means, operable independently of said first calibration means, for adjusting the relative spacing between said first and second electrical contacts when said pressure selection means is set at a second pressure setting and a second reference pressure is applied to said pressure chamber;

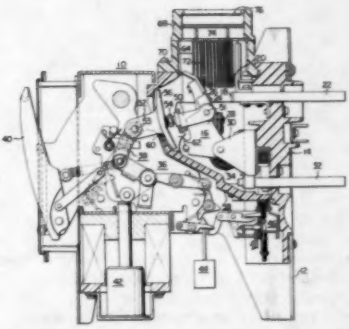
whereby calibration of said switch is maintained for all intermediate settings of said pressure selection means between said first and second pressure settings.

4,388,506

CIRCUIT INTERRUPTER

Wasaburo Murai, Osaka, and Masao Horikawa, Yamatokoriyama, both of Japan, assignors to Terasaki Denki Sangyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 10,139, Feb. 7, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 323,991
Int. Cl.³ H01H *33/04, 33/42*
U.S. Cl. 200—144 R **5 Claims**



1. A circuit interrupter having an uncovered operating mechanism and comprising:

a contact structure including a pair of separable contacts which are connectable to an external circuit;

an arc extinguisher which is disposed in a direct facing relationship with an electric arc established between said pair of separated contacts;

an electrically insulated chamber housing, having said contact structure together with said arc extinguisher disposed therein, and defining a contact chamber with said contact structure at one end and an arc extinguisher chamber with said arc extinguisher at the other end, and having a first opening for exhaust the arc gas at said arc extinguisher chamber side;

an operating mechanism, which is disposed exterior to said insulating chamber housing, for operating said contact structure; and interconnecting means, electrically isolating said operating mechanism from said contact structure and including an electrically insulating member movably extending through said insulating chamber housing, for operatively interconnecting but electrically insulating said contact structure and said operating mechanism, and for transmitting the movements of the operating mechanism to the contact structure;

said operating mechanism being groundable and also isolated from the contact structure by said insulating chamber housing at the clearance existing therebetween;

said insulating chamber housing substantially enclosing said contact structure with substantially the minimum dimensions necessary for accommodating the contact movement so as to promote the movement of a blast of ionized gas which has been generated by the electric arc established

between said contacts from said insulating chamber housing to the exterior of said insulating chamber housing through said arc extinguisher and said first opening;

said arc extinguisher chamber being directly and fluid dynamically smoothly connected for at least substantially maintaining a smooth gas flow from said contact chamber.

4,388,507

EXCESS-CURRENT PROTECTIVE SWITCH

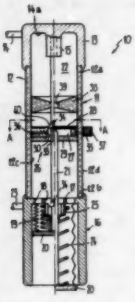
Adrian W. Roth, Aarau, and Tibor Morva, Oberentfelden, both of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed Sep. 28, 1981, Ser. No. 306,153

Claims priority, application Switzerland, Oct. 17, 1980, 7766/80

Int. Cl.³ H01H *33/70*

U.S. Cl. 200—148 R **13 Claims**



1. An excess-current protective switch operative between a cut-on position and a cut-off position comprising:

a stationary contact element;

a movable contact element engageable with said stationary contact element in the cut-on position of the switch;

said movable contact element being displaceable between a cut-on position and a cut-off position;

said movable contact element being subjected to a force tending to displace the same into its cut-off position;

a locking device for locking said movable contact element in the cut-on position;

said locking device comprising a substantially U-shaped locking element formed of a soft magnetic material and surrounding said movable contact element with play;

means mounting said locking element for movement transversely with respect to the flow of current to said movable contact element;

said substantially U-shaped locking element having free leg ends;

stop means provided for at least one free leg end of said locking element;

a stop nose provided for and movable in conjunction with said movable contact element; and

said stop means cooperating in the cut-on position with said stop nose.

4,388,508

SWITCH ACTUATING MECHANISM

Dallas W. Wilson, 2015 NW. 23rd Ave., Portland, Oreg. 97210

Filed Sep. 25, 1981, Ser. No. 305,544

Int. Cl.³ H01H *3/04*

U.S. Cl. 200—153 C **13 Claims**

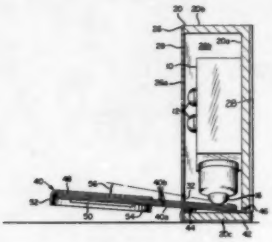
1. A switch actuating mechanism for switches having a movable contact, comprising:

(a) a switch holder,

(b) a flexible arm having an inner end mounted on said switch holder and an outer manually engageable end projecting from said switch holder,

(c) a switch actuating arm supported on said flexible arm in overlapping relation and having an outer end secured to the outer end of said flexible arm and an inner end supported freely on the inner end of said flexible arm and arranged to be disposed adjacent to a movable switch contact,

(d) and a fulcrum disposed between said flexible arm and said switch holder over which said flexible arm can flex,



(e) said fulcrum being spaced from the inner end of said switch actuating arm to form a lever for said inner end of said switch actuating arm,

(f) said flexible arm being of sufficient spring strength such that upon flexing it over said fulcrum by movement of its outer operating end the inner lever end of said switch actuating arm is pivoted for actuating a movable switch contact.

4,388,509

SYNTHETIC-RESIN AND METALLIC LAYERED HOUSING FOR HAND-HELD APPLIANCE

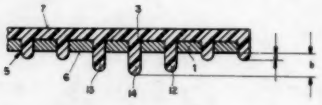
Roland Ullmann, Obertshausen, and Klaus Zimmermann, Bremthal, both of Fed. Rep. of Germany, assignors to Braun AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 938,103, Aug. 30, 1978, abandoned. This application Jan. 12, 1982, Ser. No. 338,900

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739137

Int. Cl.³ H01H *9/04, 9/06*

U.S. Cl. 200—157 **5 Claims**



1. In a switchable hand-held appliance, in combination:

a housing having a rigid wall formed with an array of perforations extending between an inner and an outer face thereof;

an elastomeric nonmetallic sheet overlying said wall at said inner face thereof and formed with a multiplicity of bosses each penetrating a respective perforation and extending beyond said outer face; and

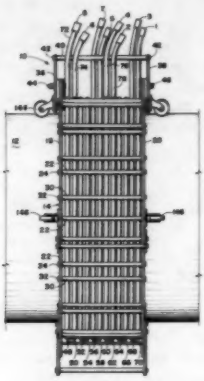
switch means in said housing juxtaposed with a portion of said sheet carrying some of said bosses, said portion being inwardly deflectable away from said wall by finger pressure exerted upon said some of said bosses for actuating said switch means, the remainder of said sheet being fixed to said wall and preventing a depression of all other bosses.

4,388,510

HEATING COLLAR WITH QUADRAFILAR WINDINGS

William L. Hughes, Stillwater, Okla., assignor to Commercial Resins Company, Tulsa, Okla.

Filed Jun. 12, 1981, Ser. No. 273,233
Int. Cl.³ H05B 6/10, 6/44
U.S. Cl. 219—8.5 2 Claims



1. Apparatus for producing induction currents in a pipe to heat the same comprising an axially extending collar adapted to removably surround said pipe, said collar including at least two arcuate frames hingedly connected in end to end circumferential relationship and having a pair of free ends adapted to be opened for placing the frames around the pipe, a plurality of electrically conducting wires carried upon said frames across the axial width thereof and extending circumferentially between the free ends, a connector assembly mounted at each free end, each connector assembly having a plurality of connectors, each connector of each assembly being connected to an end of a wire and being connected electrically to a connector of the other assembly when the frames are in closed position around the pipe, the wires on one axial half of said collar being connected to each other to form two interlaced bifilar windings; the wires at the other axial end of the collar being interconnected to form two interlaced bifilar windings arranged in end to end axial relationship with the bifilar windings of the first axial end of the collar thereby resulting in an overall quadrafilar winding for the collar, means for connecting the bifilar windings at one axial end of said collar to a source of alternating electric potential to produce induction heating in the pipe, and means for connecting the bifilar windings at the other axial end of the collar to a source of alternating electric potential to produce induction heating in the pipe.

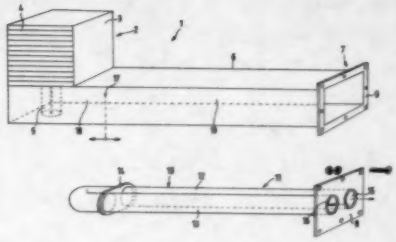
4,388,511

MICROWAVE HEATING APPARATUS FOR CIRCULABLE MEDIA

Wolfgang Sander, Ortenberg, and Ernst-Günter Jung, Breuberg, both of Fed. Rep. of Germany, assignors to Jung GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,358
Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019720
Int. Cl.³ H05B 9/06
U.S. Cl. 219—10.55 R 5 Claims

1. A microwave apparatus for media which can be circulated and heated by high frequencies, comprising a microwave transmitter, an elongated shaft having the same rectangular cross-section transverse of the elongated direction thereof over the elongated dimension of said shaft, said shaft having a first end and a second end spaced apart in the elongated direction, said microwave transmitter opening into said shaft adjacent the first end thereof, said shaft forming a hollow wave guide extending in the elongated direction thereof from the first end toward the second end and a resonator chamber extending from the end of said wave guide closer to the second end of said shaft to the second end of said shaft, a microwave permeable conductor located within said resonator chamber and ex-



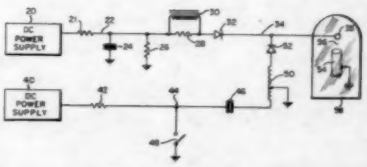
tending from the second end of said shaft for transporting the medium to be heated through the resonator chamber, and said microwave permeable conductor comprising a substantially hairpin-shaped loop having an inlet and an outlet each located at the second end of said shaft.

4,388,512

ALUMINUM WIRE BALL BONDING APPARATUS AND METHOD

Thomas E. Salzer, Bedford, Mass., and John R. Saxelby, Jr., Dallas, Tex., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 9, 1981, Ser. No. 242,073
Int. Cl.³ B23K 9/06
U.S. Cl. 219—56.22 22 Claims



1. The method of forming a substantially spherical shape on the end of an aluminum wire in preparation for ball bonding said wire to a substantially planar surface, comprising the steps of:

positioning an electrode, said wire and said substantially planar surface in a protective environment of an inert gas;

providing an arc gap between said electrode and said end of said wire;

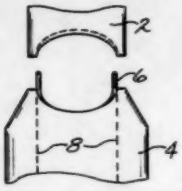
applying a first potential voltage from a direct current source across said gap, said first voltage being less than the minimum sparking potential of said gap; and

applying an impulse second potential voltage across said gap, said second voltage being greater than the minimum sparking potential of said gap to provide a spark across said gap, said spark initiating an arc of current from said source across said gap, said arc continuing after said impulse for a period of time less than 200 microseconds until said current decays to a level insufficient to sustain said arc.

4,388,513
HIGH VOLTAGE WELDING

Carl H. Brastow, Foxboro, Mass.; Joel D. Mallett, Warwick, R.I., and Douglas J. Livingston, New London, N.H., assignors to Conceptual Engineering Associates, Inc., Foxboro, Mass.

Filed Jan. 29, 1981, Ser. No. 229,553
Int. Cl.³ B23K 9/14, 9/12
U.S. Cl. 219—58 15 Claims

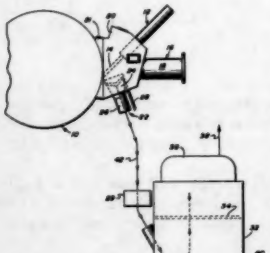


1. A process for welding small diameter wire into a closed loop comprising the steps of presenting, supporting and forming a selected length of wire in the range of approximately 0.010 inch to 0.062 inch diameter, having two opposite ends into an essentially closed loop with the ends of the wire closely disposed to each other, positioning an electrode having a tip end within an open ended sleeve with the tip end spaced inwardly from the open end of the sleeve, placing the open end of the sleeve member closely adjacent to the ends of the wire, means for producing a short duration flow of energy between the electrode and the ends of the wire including establishing a first high voltage arc between the electrode and the ends of the wire and thereafter creating a second low voltage, high amperage arc between the electrode and the ends of the wire and then deenergizing the electrode before the next length of wire to be welded is presented.

4,388,514
METHOD FOR COLLECTING PROCESS GENERATED FUME AND/OR SLAG

William J. Coughlin; Stephen A. Hoffman, both of Lancaster, and Perry J. Rieppel, Worthington, all of Ohio, assignors to Arcair Company, Lancaster, Ohio

Division of Ser. No. 25,320, Mar. 30, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 269,198
Int. Cl.³ B23K 9/32
U.S. Cl. 219—69 R 3 Claims



1. A method for collecting fume, solid particulate matter, molten metal and molten slag generated by operation of an air-carbon arc cutting and gouging apparatus comprising the steps of:

isolating from the ambient environment an area surrounding the apparatus where fume, solid particulate matter, molten metal and molten slag is generated by the air-carbon arc cutting and gouging apparatus thus forming an atmosphere containing air, other gases, fume, solid particulate matter, molten metal and molten slag;

directing said atmosphere to a withdrawal apparatus wherein an air-water mixture is directed at said atmosphere and continuously withdrawing the atmosphere inside said isolated area through withdrawal apparatus wherein said air-water mixture cools said molten metal and molten slag and entrains said solid particulate matter;

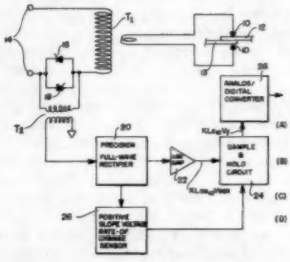
separating said water and solid particulate matter, cooled molten metal and cooled molten slag from said air and other gases; and

passing said air and other gases through a filter to remove any airborne particulate matter.

4,388,515
RESISTANCE WELDING CONTROL SYSTEM

James K. Mathews, Van Nuys, Calif., assignor to Pertron Controls Corporation, Canoga Park, Calif.

Filed Mar. 19, 1981, Ser. No. 245,261
Int. Cl.³ B23K 11/24
U.S. Cl. 219—110 7 Claims



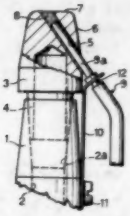
1. A control system for use in conjunction with a controller which controls a resistance type of welding machine during the production of a weld, the welding machine including a welding transformer having a primary circuit connected to a source of alternating current voltage and further having a secondary circuit, and the controller including switching means connected in said primary circuit for controlling the flow of current in the secondary circuit of the welding transformer, the control system including: circuit means connected across the switching means for providing an alternating current voltage corresponding to the voltage appearing across the switching means and having a phase relation with the alternating current voltage of said source which varies with variations in the dynamic resistance of the weld being produced, and the leading edge of each half cycle of the alternating current voltage produced by said circuit means having an amplitude determined by such variations in said phase relation; differentiating circuitry connected to said circuit means for generating a pulse signal upon the occurrence of the leading edge of each half cycle of the alternating current voltage produced by said circuit means; and sample and hold circuitry connected to said circuit means and to said differentiating circuitry for producing an output signal representative of the amplitude of the leading edge of each half cycle of the alternating current voltage produced by said circuit means.

4,388,516

ELECTRODE TIP FOR ELECTRIC SPOT WELDING

Mario Ferrero, Turin, and Giovanni Balestrino, Orbassano, both of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Mar. 27, 1981, Ser. No. 248,632
Claims priority, application Italy, May 14, 1980, 67758 A/80
Int. Cl.³ B23K 9/24
U.S. Cl. 219—119 1 Claim



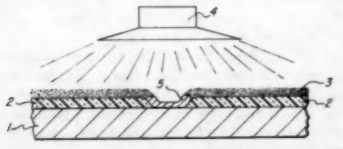
1. An electrode tip for electric spot welding comprising a tip having a hole which extends from one side of said tip up to the end surface of said tip for receiving one end of a flexible bundle of optical fibers which is intended to transmit a signal indicative of the temperature reached at said end surface of said tip, an insert interference fitted within the hole and arranged adjacent to said end surface of said tip in order to insure the continuity of said end surface and resilient means comprised of a flat spring fixed at one end to said electrode and provided at the other end with a support seating for said bundle of optical fibers for biasing the end of said bundle of said optical fibers located in said hole against said insert.

4,388,517

SUBLIMATION PATTERNING PROCESS

Eric F. Schulte, Richardson, and Vernon R. Porter, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 22, 1980, Ser. No. 189,495
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 LJ 4 Claims



1. A method for patterning a layer of material on a substrate, comprising the steps of:

(a) selecting a substrate having high thermal conductivity;

(b) depositing an insulating material having a low thermal conductivity over predetermined areas of the substrate;

(c) depositing on said insulating material and on said substrate a thin film of a material capable of absorbing radiated energy easily; and

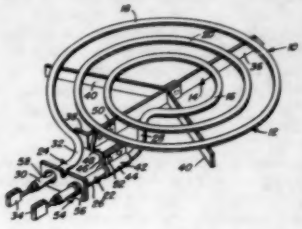
(d) subjecting said thin film to radiant energy sufficient to cause selective sublimation of said thin film layer of material directly over said insulating material.

4,388,518

ELECTRIC SURFACE HEATER ASSEMBLY

Henry O. Willbanks, and Richard P. Johnson, both of Cookeville, Tenn., assignors to Teledyne Still-Man Manufacturing, Cookeville, Tenn.

Filed Dec. 21, 1981, Ser. No. 333,106
Int. Cl.³ H05B 3/68
U.S. Cl. 219—455 11 Claims



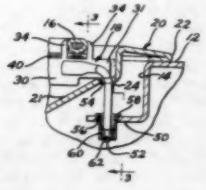
1. An electric surface heater assembly comprising a tubular heating element and a support spider, said heating element comprising a generally planar central heating portion defined by multiple convolutions including an outer convolution and an inner convolution with outer and inner terminal legs extending respectively therefrom, said terminal legs including terminal end portions offset below the central heating portion and extending in lateral spaced relation to each other, and depending vertical shoulder portions between said terminal end portions and the respective inner and outer convolutions, said spider defining a support means for the central heating portion, said central heating portion freely overlying said spider, and a bracket securing said spider to said heating element remote from the central heating portion, said bracket being positioned solely between and secured to the inner terminal leg and said spider, said bracket including an elongated sleeve encircling the terminal end portion of said inner terminal leg, and a panel portion projecting vertically from said sleeve to said spider.

4,388,519

NOISE ISOLATION MEANS FOR CONVOLUTED SHEATHED ELECTRIC HEATER

James A. Dooley, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Feb. 1, 1982, Ser. No. 344,854
Int. Cl.³ H05B 3/68
U.S. Cl. 219—463 6 Claims



1. An electric cooking range having a cooktop formed with an opening including an inwardly extending flange portion for supporting a heating unit in said opening, comprising:

a sheathed heating element mounted in said opening, said heating element having convolutions disposed in a single plane defining a cooking surface;

a pan means including a body portion adapted to be positioned in said opening and a ring portion dimensioned for supporting said pan on said cooktop;

a support frame member arranged in said body portion of

said pan means including a plurality of support arms extending generally radially being arranged vertically on edge, with the outer lower edge portion of said support arms being supported on said body portion of said pan means, and the heating element being supported on the upper edge in a single plane;

holding means on the upper edge of at least one of said support arms immovably securing the outer portion of said convoluted heating element to said at least one of said support arms;

positioning element on at least one of said support arms extending downwardly therefrom through corresponding aligned opening in said body portion of said pan for engaging said flange portion for positioning and rigidly sandwiching said pan means between said support frame and said flange portion for supporting said heating unit in said opening;

resilient thermal insulating pad means positioned on said upper edge of said support arms being interposed at the point of contact between said upper edge and said heating element to cushion vibrations and to thermally insulate said heater element from said support frame.

4,388,520

ELECTRIC COOKERS WITH WARNING LIGHTS

Joseph A. McWilliams, Droitwich, England, assignor to Micropore International Ltd., Droitwich, England

Filed Aug. 3, 1981, Ser. No. 289,134

Claims priority, application United Kingdom, Aug. 13, 1980, 8026463; Fed. Rep. of Germany, Feb. 7, 1981, 3104265; United Kingdom, Feb. 9, 1981, 8103869

Int. Cl.³ H05B 3/76

U.S. Cl. 219—464 **18 Claims**

1. An electric cooker comprising:

a cooking surface;

at least one heater arranged on an underside of the cooking surface, said at least one heater comprising:

a housing comprising a base and an upwardly extending outer rim, the rim having an upper edge which is in contact with the underside of the cooking surface so as to form an enclosed chamber between the underside of the cooking surface and the housing;

a heating element mounted in the housing;

a thermal cut-out to protect against overheating of the cooking surface, which thermal cut-out extends through a first opening in the outer rim and passes above the heating element;

a mechanical switch co-operable with the thermal cut-out to deenergise the heating element in the event of overheating; and

a second opening formed in the housing to connect the enclosed chamber with the outside of the heater;

a temperature responsive element arranged externally of the enclosed chamber and positioned relative to said second opening such that, on energising the heating element, the temperature responsive element is heated by hot air issuing from the enclosed chamber by way of said second opening so that the temperature of the temperature responsive element is representative of the temperature of the cooking surface; and

means for indicating when the temperature responsive element is at at least a predetermined temperature.

4,388,521

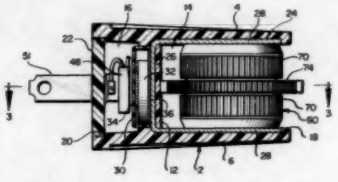
MODULAR DISINFECTOR DEVICE

Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Jul. 2, 1981, Ser. No. 279,805

Int. Cl.³ A61L 3/00, 2/04

U.S. Cl. 219—521 **12 Claims**



1. Modular lens disinfecting device comprising a plastic housing having front and rear ends and a cavity with a first pair of opposed walls, a metal heat sink lining said opposed walls and being presented toward said cavity, a second pair of opposed walls transverse to said first pair of walls and cooperating therewith to define a front opening into said cavity, said second pair of walls having slots extending from said opening toward said rear end to form additional openings into said cavity, electrically operating heating means in thermal relation with said heat sink, and a plastic lens case sized for removable insertion into said cavity through said front opening, said case having opposed surfaces engaging said heat sink and radial flange means projecting through said slots.

4,388,522

ELECTRICALLY HEATED BACKLITE STRUCTURE

Premakaran T. Boaz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 214,364, Dec. 8, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,965

Int. Cl.³ H05B 3/06

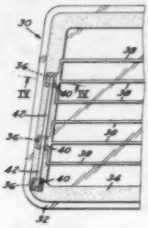
U.S. Cl. 219—522 **12 Claims**

1. In an electrically heated backlite of the type formed on a glass sheet having an inner surface which will face the interior of a vehicle when in an installed position and an outer surface which will face the exterior of the vehicle when in an installed position, the improvement comprising:

an opaque, electrically nonconductive coating bonded to at least two portions of said inner face of said glass sheet, said two portions of said electrically nonconductive coating being spaced apart from one another on said inner surface of said glass sheet, each of said portions of said electrically nonconductive coating having at least one open area formed therein in which said inner surface of said glass sheet is exposed;

an electrical resistance heater line having spaced terminal ends, said heater line being bonded over a majority of its bonding surface area to said inner surface of said glass sheet, said heater line extending in a length dimension from one of said portions of said electrically nonconductive coating to the other of said portions of said electrically nonconductive coating, one of said terminal ends of said heater line (1) overlying and bonded to at least part of one of said portions of said electrically nonconductive coating, and (2) overlying and bonded to all of said inner

surface of said glass sheet exposed in said open area formed in said one of said portions of said electrically nonconductive coating, said other of said terminal ends of said heater line (1) overlying and bonded to at least a part of said other of said portions of said electrically nonconductive coating, and (2) overlying and bonded to all of said inner surface of said glass sheet exposed in said open area formed in said other of said portions of said electrically nonconductive coating, said bond between said terminal ends and said inner surface of said glass sheet



being stronger than said bond between said terminal ends and said portions of said electrically nonconductive coating;

at least a pair of electrical conductors;

bond means for bonding one of said conductors to each of said terminal ends of said heater line at said location where each of said terminal ends overlies said inner surface of said glass sheet exposed by said open area of said portion of electrically nonconductive coating which said terminal end overlies.

4,388,523

ELECTRICAL HEATING CABLE CONNECTOR

Henry Keep, Jr., Madison; Daniel A. Santagata, Branford; Matthew E. Harris, Clinton, and William H. Welsh, Jr., Madison, all of Conn., assignors to Multistress, Inc., Madison, Conn.

Filed Jun. 10, 1981, Ser. No. 272,260
Int. Cl.³ H05B 3/08
U.S. Cl. 219—541 **9 Claims**

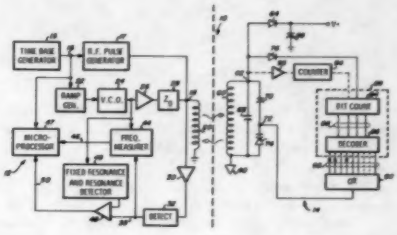
1. A connector for joining an end of an electrical resistance heating wire of an electrical heating cable enclosed in watertight tubing with an end of the wire of an insulated electrical conductor, comprising a heat-absorbing electrically conductive core member to receive and be clamped onto the wire ends, a rigid sleeve forming an elongate cavity to receive said core member with the wire ends fastened thereto, electrical insulation inside said sleeve between it and the core member and the wire ends, a coupling ring fixed detachably onto each end of said sleeve, means connectable detachably with one of the coupling rings for clamping it substantially immovably onto an end portion of said tubing, and means associated with the other of the coupling rings for forming a substantially water-tight joint between it and the insulated conductor.

4,388,524

ELECTRONIC IDENTIFICATION AND RECOGNITION SYSTEM WITH CODE CHANGEABLE REACTANCE

Charles A. Walton, 19115 Overlook Rd., Los Gatos, Calif. 95030

Filed Sep. 16, 1981, Ser. No. 302,706
Int. Cl.³ G06K 5/00
U.S. Cl. 235—380 **15 Claims**



1. An electronic recognition-identification system comprising:

a recognition network with a sweep oscillator for generating signals of various frequencies, a first antenna means for radiating signals responsive to the oscillator frequencies and for radiating to another antenna means, means connected to said first antenna means for detecting perturbations in the signals across said first antenna means and for delivering information signals responsive to said perturbations; and

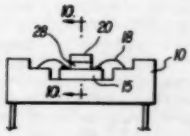
an identification network including a second antenna means for radiating to said first antenna means, a data register means to advance and provide a sequence of data, a reactance modulation circuit connected to the second antenna means and to said data register means such that the frequency of said modulation circuit varies responsive to said sequence of data.

4,388,525

PRECISION OPTICAL SPACERS FOR IMAGE SENSOR FILTERS

William S. Phy, Los Altos Hills, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Feb. 11, 1981, Ser. No. 233,347
Int. Cl.³ H01J 40/14
U.S. Cl. 250—211 J **4 Claims**



1. A structure comprising

an image sensing device containing bonding pads;

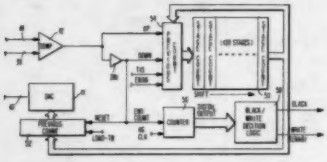
a filter;

an electrically conductive pattern on the filter separating the filter from the image sensing device, the pattern disposed on the filter not in contact with the bonding pads.

4,388,526
MEASURING APPARATUS WITH RESPONSE ADJUSTMENT

Eugene N. Schroeder, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,317
Int. Cl.³ H01J 40/14
U.S. Cl. 250—214 R 7 Claims

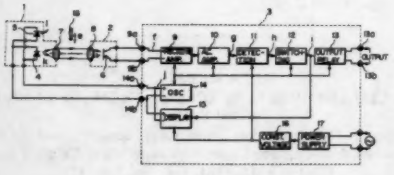


1. An electrical measuring apparatus in which a current acceptor has one current-accepting limit after a first status sensed by said system and a substantially different current-accepting limit after a second status sensed by said system wherein the improvement comprises means to store a count representative of said current-accepting limit after a prior sensing, means to charge said current acceptor in an amount corresponding to the magnitude of said count such that said acceptor will be fully charged in a predetermined time when said current-accepting capacity corresponds to that represented by said count, timing means to time said charging, and means controlled by said timing means to change said count at least one increment when the said timing means measures a time to charge substantially different from said predetermined time.

4,388,527
PHOTOELECTRIC SWITCH

Toshifumi Fukuyama, and Norio Onji, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jun. 16, 1981, Ser. No. 274,215
Claims priority, application Japan, Jun. 16, 1980, 55/81102
Int. Cl.³ H01J 40/14
U.S. Cl. 250—214 R 2 Claims

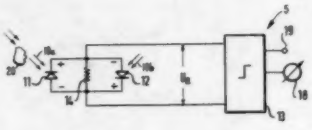


1. A photoelectric switch comprising a photoelectric detection means, a circuit means disposed independently of said detection means, and cable means interconnecting said detection and circuit means, there being formed in said photoelectric detection means a parallel circuit comprised of a light emission photodiode and a display photodiode of opposite polarity thereto as connected in parallelcircuit relation, which parallel circuit is connected to a pulse oscillation circuit included in said circuit means with a couple of lines, whereby a pulse current of single polarity is applied from said pulse oscillation circuit to said parallel circuit to thereby actuate only said light emission photodiode, and there being disposed in said circuit means a display circuit which functions in response to a detection output obtained in said circuit means so that through said two lines a pulse current of opposite polarity to the first-mentioned pulse current flows to said parallel circuit in a phase where said first-mentioned pulse current is non-existent to thereby actuate said display photodiode.

4,388,528
PHOTOELECTRONIC APPARATUS

Arthur Walter, Waldkirch, Fed. Rep. of Germany, assignor to Erwin Sick Gesellschaft-Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Division of Ser. No. 874,673, Feb. 2, 1978, abandoned. This application Oct. 30, 1980, Ser. No. 202,280
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1977, 2704565
Int. Cl.³ H01J 40/14
U.S. Cl. 250—221 12 Claims

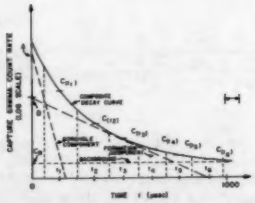


1. Photoelectronic apparatus having photoelectric convertor means including a first operational photoelectric convertor which in operation is adapted to receive a light beam from a source, a processing circuit adapted to process an output from the photoelectric convertor means to generate a control signal in response to an obstruction of the light beam, and protective means adapted to prevent the photoelectronic apparatus from failing to recognize the obstruction in the presence of unwanted stray light, the protective means comprising a second auxiliary photoelectric convertor disposed in the immediate vicinity of the first operational photoelectric convertor, and circuit means for forming a weighted difference signal between the outputs of the first operational photoconvertor and the second auxiliary photoconvertor, the last mentioned means determining a predtermined threshold for stray light below which the photoelectric convertor will always deliver the control signal in the presence of the obstruction irrespective of the level of stray light and above which as a safety measure the control signal will always be delivered irrespective of whether the beam is obstructed or not.

4,388,529
SYSTEM FOR SIMULTANEOUS MEASUREMENT OF BOREHOLE AND FORMATION NEUTRON LIFETIMES

Harold E. Peelman, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 182,172, Aug. 28, 1980, abandoned. This application Jun. 23, 1982, Ser. No. 391,204
Int. Cl.³ G01V 5/00
U.S. Cl. 250—270 18 Claims



1. A system for simultaneously measuring the thermal neutron decay time of materials in and about a well borehole, comprising:

means for generating, in a well borehole, a relatively short duration discrete burst of fast neutrons which are rapidly moderated by interaction with nuclei of materials in the borehole and surrounding earth formations and slowed

down to thermal energy, creating a thermal neutron population in the borehole and surrounding earth formations;

means for detecting, in the borehole, radiations representative of the thermal neutron population in the borehole and surrounding earth formations, in at least four separate time intervals subsequent to said burst of fast neutrons and means for generating at least four count signals representative of said thermal neutron population during said at least four separate time intervals; and

means for combining said at least four count signals according to a predetermined relationship to simultaneously separate and derive at least two measurement signals representative of the thermal neutron population decay time of the borehole medium and the earth formation medium in the vicinity of the borehole.

4,388,530

PROCESS AND APPARATUS FOR THE CONTINUOUS MEASUREMENT OF ELEMENT CONTENTS

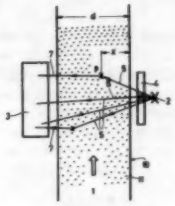
Andrzej Lubecki, Stutensee-Bl.; Kurt Wiese, Stutensee-Büchig, and Karl Winkler, Steinweiler, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung, Karlsruhe, Fed. Rep. of Germany

Filed Apr. 18, 1980, Ser. No. 141,698

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2915986

Int. Cl.³ G01N *23/20*; **G21K** *1/00*

U.S. Cl. 378—45 **22 Claims**



1. A process for the continuous measurement, by X-ray fluorescence analysis, of the element content of a slurry, independently of the slurry density and slurry composition comprising:

(a) passing a sample of the slurry to be measured between an excitation source of primary radiation and a detector, with a target being arranged between the source and the sample so that (1) a portion of the source radiation excites the target to emit a target radiation which penetrates the sample and then is absorbed by the detector, (2) a portion of the source radiation penetrates the sample and excites in the slurry among other elements the element which is to be measured to emit elemental X-ray radiation which is then absorbed by the detector, and (3) a portion of the source radiation penetrates and passes through the sample and is absorbed by the detector; and

(b) evaluating the radiation absorbed by the detector to directly determine the elemental content of the sample.

4,388,531

IONIZER HAVING INTERCHANGEABLE IONIZATION CHAMBER

George C. Stafford, and David R. Stephens, both of San Jose, Calif., assignors to Finnigan Corporation, Sunnyvale, Calif.

Filed Mar. 6, 1981, Ser. No. 241,083

Int. Cl.³ H01J *27/00*

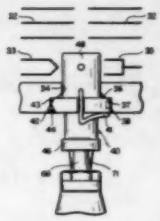
U.S. Cl. 250—427 **10 Claims**

1. An ionizer adapted to be placed in a vacuum envelope for providing ions of a sample to be analyzed including

(a) an electron source

(b) ion accelerating and focusing electrodes

(c) an interchangeable ionization chamber including an adapter and a hollow member slidably removably secured to the adapter, said hollow member including a first opening for allowing electrons to enter the chamber and an exit opening to allow ions to exit said chamber, and



(d) means for receiving and supporting said ionization chamber in cooperative relationship with said electron source and accelerating and focusing electrodes whereby electrons enter said chamber through said first opening and form sample ions in the chamber which then exit the chamber through said exit opening toward said accelerating and focusing electrodes.

4,388,532

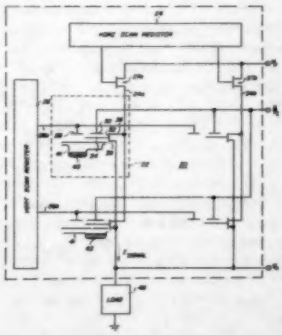
SOLID STATE IMAGE SENSOR WITH IMAGE SENSING ELEMENTS HAVING CHARGE COUPLED PHOTOCAPACITORS AND A FLOATING GATE AMPLIFIER

Enrique Garcia, Sandy Hook, Conn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 27, 1981, Ser. No. 258,152

Int. Cl.³ H04N *3/16*

U.S. Cl. 250—578 **6 Claims**



1. A solid state image sensing array comprising a plurality of image sensing elements, each of said elements comprising:

a first MOS capacitor;

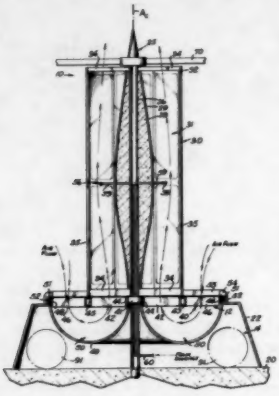
a second MOS capacitor disposed adjacent said first MOS capacitor; and

a floating gate FET, the floating gate of said FET being disposed beneath the electrode of said second MOS capacitor, whereby when a photocharge accumulated in said first MOS capacitor is shifted to said second MOS capacitor, the gate of said floating gate FET is modulated to provide a nondestructive amplified readout of said photocharge through said FET.

4,388,533
POWER GENERATING SYSTEM

Larry K. Campbell, 3445 Almand Dr., Apt. B-1, and William D. Farrier, 3445 Almand Dr., Apt. D-2, both of College Park, Ga. 30337

Filed Mar. 20, 1981, Ser. No. 246,118
Int. Cl.³ F03G 7/02; H02P 9/04
U.S. Cl. 290—1 R 8 Claims



1. A power generating system for supplying electrical power to an external electrical power demand load comprising:

an elongate vertically oriented centerbody adapted to absorb radiant solar energy therein to be heated;

an annular enclosure around said centerbody defining a vertically extending air passage within said enclosure around said centerbody open to the atmosphere at its upper end, said annular enclosure including transmission sections therein around said centerbody capable of transmitting radiant solar energy therethrough toward said centerbody;

mirror means for directing solar radiant energy through said transmission sections in said enclosure across said air passage and onto said centerbody to heat said centerbody so that the air in said air passage is heated by said centerbody to rise out of the upper end of said passage;

air inlet means defining an inlet passage therein in communication with the lower end of said air passage for directing atmospheric air into the lower end of said air passage so that the pressure differential generated within said air passage as the air is heated by said centerbody induces an air flow through said inlet passage and along said air passage from the lower end to the upper end thereof;

rotor means rotatably mounted in said inlet means and including a plurality of vanes operatively associated with the air passing through said air inlet means so that the air flowing through said air inlet means causes said rotor means to rotate; and

electrical power generating means operatively connected to said rotor means so that rotation of said rotor means causes said generating means to generate electrical power for the external electrical power demand load.

4,388,534
UNINTERRUPTIBLE POWER SUPPLY

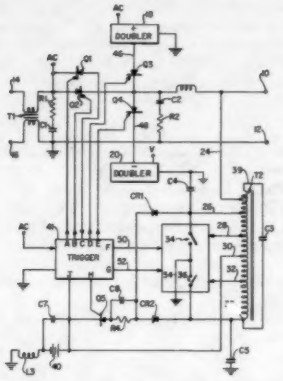
Roger R. Love, Florham Park, and John Metroke, Oxford, both of N.J., assignors to Computer Power, Inc., High Bridge, N.J.

Filed Aug. 11, 1981, Ser. No. 291,926
Int. Cl.³ H02J 9/06
U.S. Cl. 307—66 10 Claims

1. An uninterruptible power supply operable to supplant a primary power source with a secondary power source when the primary power source fails, said supply comprising:

a pair of output terminals;

switching means responsive to the electrical potential of said primary power source for selectively coupling said primary source or said secondary source to said output terminals, said switching means including a pair of switching semiconductors each having a separate control electrode and a pair of switching electrodes; and



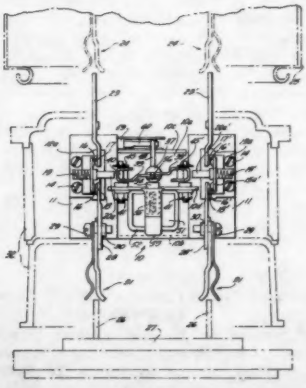
energy storage means coupled to said primary power source and operable to supply energy to said output terminals during the time for switching between said primary power source and said secondary power source;

wherein said switching means provides a current path from said primary power source to said output terminals which by-passes said secondary power source.

4,388,535
ELECTRIC POWER INTERRUPTING SWITCH

Dominik M. Wiktor, Cranford, and Siegfried Schlindwein, Succasunna, both of N.J., assignors to Automatic Switch Company, N.J.

Filed May 18, 1981, Ser. No. 265,500
Int. Cl.³ H01H 19/64; H02B 1/20
U.S. Cl. 307—113 16 Claims



1. A switch for interrupting electric power to the customer of a utility, there being an electric watt-hour meter between the utility source and the customer's load, the switch comprising:

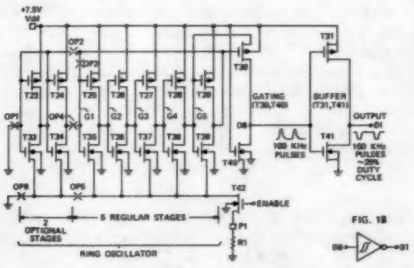
(a) two female contact members for accommodating the male plug-in contacts of a watt-hour meter,
(b) two male contact members capable of being accommodated by the female contacts into which the watt-hour meter is usually plugged,
(c) switch means between at least one of the female contact members and a corresponding one of the male contact members,
(d) electrically-controlled operator means for opening the switch means in response to an electrical signal, and
(e) means operable in response to opening of the switch means for latching the switch means in its open condition to hold the switch means open even after termination of the electrical signal,
whereby when the switch means is opened by the operator means, at least one female contact member is electrically disconnected from its corresponding male contact member to thereby interrupt the flow of utility power to the customer load, the interruption continuing as long as the latching means holds the switch means open.

4,388,536

PULSE GENERATOR FOR IC FABRICATION

William Peil, North Syracuse; Thomas A. Brown, Fulton, and Marc A. Dissosway, Liverpool, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,359
Int. Cl.³ H03K *5/08*
U.S. Cl. 307—268 **16 Claims**



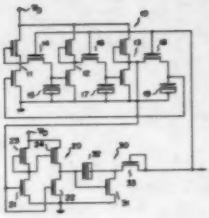
1. A pulse generator for integrated circuit fabrication of predetermined frequency and producing an output pulse having a desired duty cycle, comprising:
(a) a positive terminal for connection to a source of positive bias potentials; and a common terminal;
(b) a ring oscillator comprising an odd number (m) of complementary metal oxide semiconductor (CMOS) field effect transistor inverter stages,
(i) each stage including a p-channel device, having the source thereof conductively connected to said positive terminal, and an n-channel device having the drain thereof connected to the drain of the associated p-channel device, the drain connection forming an output of that stage,
(ii) the gates of the p- and n-channel devices of each stage being connected together, the gate node forming an input of that stage,
(iii) the input of each stage being connected to the output of a preceeding stage to form a ring;
(c) the sources of said n-channel devices being connected together; and a resistance of a preselected value connecting said source connection to said common terminal, the resistance value determining the oscillator frequency, and
(d) gating means responsive to electrical conditions in at least two stages of said ring oscillator for generating an output pulse having said desired duty cycle.

4,388,537

SUBSTRATE BIAS GENERATION CIRCUIT

Akira Kanuma, Stanford, Calif., assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 3, 1980, Ser. No. 212,520
Claims priority, application Japan, Dec. 27, 1979, 54-171657
Int. Cl.³ H03B *5/24;* **H03L** *7/04*
U.S. Cl. 307—297 **6 Claims**



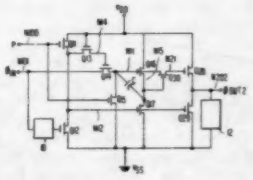
1. A substrate bias generation circuit comprising:
a voltage-controlled oscillator circuit having a controlled terminal for receiving an input signal for controlling said voltage-controlled oscillator circuit to produce an oscillation output signal, said voltage-controlled oscillator circuit including a ring oscillator circuit comprising an odd number of inverter means each having a delay function with a delay time changed in accordance with said input signal received by said control terminal;
a driving circuit for producing a driving signal in accordance with said oscillation output signal from said oscillator circuit; and
a charge pump circuit for producing a substrate bias voltage in accordance with said driving signal from said driving circuit, said substrate bias voltage being supplied to said control terminal of said oscillator circuit to control the delay time of each of said inverter means.

4,388,538

DELAY SIGNAL GENERATING CIRCUIT

Hiroaki Ikeda, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1980, Ser. No. 191,622
Claims priority, application Japan, Sep. 28, 1979, 54-124961
Int. Cl.³ H03K *17/687, 19/094*
U.S. Cl. 307—482 **10 Claims**



1. A digital circuit comprising a first node, a first series circuit including a first and a second enhancement type transistors connectable between a drain supply voltage and a source supply voltage, capacitor means coupled between said first node and a common junction point of said first series circuit, first means for connecting a gate of said first transistor to said first node, control means for operatively controlling said first series circuit in such a manner that a potential at said first node is raised above said drain supply voltage in absolute value by boot-strap effect, an output node, a second series circuit including a third and a fourth enhancement type transistors connectable between a drain supply voltage and a source supply voltage, a second means for connecting a common junction point

of said second series circuit to said output node, a depletion type transistor, third means for connecting a drain of said depletion type transistor to said first node, fourth means for connecting a source of said depletion type transistor to a gate of said third transistor, and fifth means for supplying a gate of said depletion type transistor with a signal having the substantially same level as a signal at said common junction point of said first series circuit.

4,388,539

INTEGRATED CIRCUIT COMPRISING A PLURALITY OF VOLTAGE-CURRENT CONVERTERS

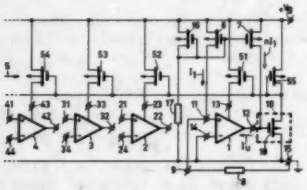
Wouter M. Boeke, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1981, Ser. No. 234,088

Claims priority, application Netherlands, Feb. 25, 1980, 8001115

Int. Cl.³ H03K *17/14;* H02J *1/04;* H03F *3/45*

U.S. Cl. 307—491 **3 Claims**



1. An integrated circuit comprising a plurality of voltage-current converters each having an input and output and a bias-signal input for controlling the transconductance of said voltage-current converters by means of a bias signal on said bias-signal input, the transconductances of the voltage-current converters being in a substantially fixed ratio to each other, a bias-signal generator for applying bias signals which are in a substantially fixed ratio to each other to said bias-signal inputs, and a control network for controlling the bias-signal generator in such a way that the transconductances of the voltage-current converters are highly insensitive to process variations and variations in operating conditions, at least one of the voltage-current converters being included in the control network as a reference converter, characterized in that the control network comprises a first and a second current source, supplying currents (I_1 and nI_1 respectively) in a substantially fixed ratio to each other, an input coupled to the input of the reference converter for coupling to a reference resistor which input is included in the output circuit of the first current source, and a comparing control amplifier coupled between the output of the reference converter and a control input of the bias-signal generator for comparing the output current of the reference converter and the current from the second current source and controlling the bias-signal generator in such a way that a substantially fixed ratio is maintained between the output currents of the reference converter and the second current source.

4,388,540

CONTROLLABLE MULTIPLIER CIRCUIT WITH EXPANDED GAIN CONTROL RANGE

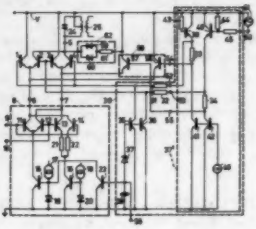
Peter H. M. Schreurs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,326

Claims priority, application Netherlands, Nov. 23, 1979, 7908535

Int. Cl.³ G06G *7/16;* H03G *3/30*

U.S. Cl. 307—493 **12 Claims**



1. A multiplying circuit comprising first and second transistors arranged in a long-tailed pair configuration having a collector output and interconnected emitter electrodes coupled to a first current source, a bias voltage adjusting circuit for applying equal base bias voltages to the base electrodes of the first and second transistors, means connecting said base electrodes to a signal input, a controlled current distribution circuit including a shunting transistor having a collector-emitter path DC coupled in parallel with said first and second transistors, and a control circuit for applying a control voltage between a base electrode of the shunting transistor and the base electrodes of the first and second transistors.

4,388,541

CIRCUIT ARRANGEMENT WITH MOS-TRANSISTORS FOR THE RAPID EVALUATION OF THE LOGIC STATE OF A SAMPLING NODE

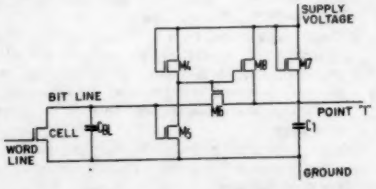
Burkhard Giebel, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 23, 1980, Ser. No. 171,342

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1979, 2932605

Int. Cl.³ H03K *5/12, 19/094*

U.S. Cl. 307—530 **5 Claims**



1. Circuit having MOS-transistors for the rapid evaluation of the logic state of a sampling node, comprising a circuit input connected to the sampling node, a circuit output, a supply voltage source, an inverter being connected to said circuit input and having an output, a first transistor being connected between said circuit input and said circuit output and having a gate connected to said output of said inverter, a second transis-

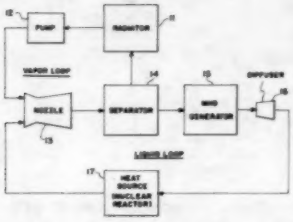
tor being connected between said supply voltage source and said circuit output and having a gate connected to said output of said inverter, and a third transistor shunted across said second transistor as a load resistor.

4,388,542

SOLAR DRIVEN LIQUID METAL MHD POWER GENERATOR

Alan M. Lovelace, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Ja H. Lee, and Frank Hohl, both of Newport News, Va.

Filed May 15, 1981, Ser. No. 263,830
Int. Cl.³ H02N *4/02*
U.S. Cl. 310—11 **10 Claims**



1. A solar driven magnetohydrodynamic (MHD) power generator that utilizes the flow of a gas and liquid-metal mixture through the channel of the MHD generator to generate electrical power comprising:

means including a mixer having a channel for mixing the gas and liquid metal and for providing a flow of the mixture from the channel of the mixer through the channel of said MHD generator;

means for collecting solar energy;

means for focusing the collected solar energy onto the gas and liquid metal mixture inside the channel of said mixer to heat said gas and liquid metal mixture before it passes through the channel of said MHD generator;

means for separating the gas from the liquid metal after it passes through the channel of said MHD generator; and

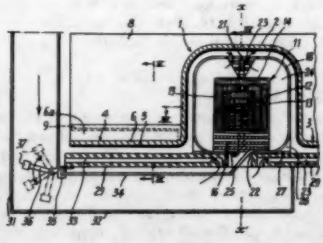
means for returning the separated gas and liquid metal back to said mixing means.

4,388,543

HIGH-POWER LINEAR ELECTRIC MOTOR

Jean Guimbal, Saint-Etienne, France, assignor to Agence Nationale de Valorisation de la Recherche - A.N.V.A.R., Paris, France

Filed Dec. 28, 1981, Ser. No. 335,168
Claims priority, application France, Dec. 29, 1980, 80 27953
Int. Cl.³ H02K *41/00*
U.S. Cl. 310—13 **17 Claims**



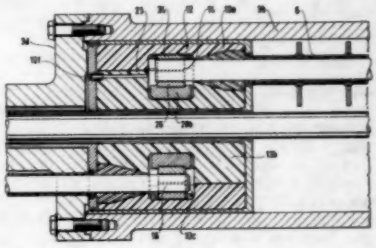
1. In a high-power linear electric motor, comprising an inductor constituted by annular coils surrounding a magnetic core of square or rectangular section, and an armature having an omega section comprising an upturned U central part and two horizontal side flanges, said upturned U central part enveloping said inductor on three sides so as to ensure the passage both of the magnetic flux and the induced currents, said armature comprises, outside, a magnetic layer extending upon the whole conductive layer, that is to say as well upon the upturned U central part as upon the two horizontal side flanges of the armature.

4,388,544

DEVICE FOR CONNECTING A COLLECTOR RING TO A CURRENT LEAD IN A SUPERCONDUCTING ROTOR

Roger Gillet, Belfort, France, assignor to Alsthom-Atlantique & Electricite de France, Paris, France

Filed Sep. 10, 1981, Ser. No. 300,827
Claims priority, application France, Sep. 15, 1980, 80 19821
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—71 **3 Claims**



1. A device for connecting a collector ring to a current lead in a superconducting rotor, said rotor having an axis of rotation which defines a longitudinal direction, wherein said device includes:

an electrically insulating connection box fitted to the rotor and having a front surface at its end nearest the collector ring and a rear surface at its end nearest the current lead;

at least one front electrically conducting rod connected to the collector ring and being disposed longitudinally in the box;

at least one rear electrically conducting rod connected to the current lead and disposed longitudinally in the box and being side by side with said front rod over a portion of its length;

inner and outer metal contact blocks mounted within said box and being positioned radially opposing each other and on opposite sides of said front and rear rods such that the outer metal contact block contacts the radially outer surfaces of said front and rear rods, said inner metal contact block contacts the radially inner surfaces of said front and rear rods and said rods slide longitudinally over the contacting surface of said inner and outer metal contact blocks absent normal speed rotor rotation; and

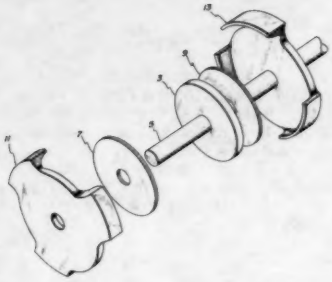
at least one radially movable flyweight placed inside the contact box in a radially inner position relative to said inner block and in operative engagement therewith, whereby; the centrifugal force resulting from rotation of the rotor exerted on said flyweight supplies a radially outward force at normal operating speed of the rotor which effectively clamps the front and rear rods between said inner and outer contact blocks to prevent relative longitudinal movement between said rods and said contact blocks to ensure good electric contact when the rotor reaches its normal working speed.

4,388,545

ROTOR FOR A PERMANENT MAGNET AC MOTOR

Vernon B. Honsinger, Ballston Lake, and Russell E. Tompkins, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 10, 1981, Ser. No. 272,153
Int. Cl.³ H02K 21/14
U.S. Cl. 310—156 3 Claims



1. A rotor for a permanent magnet self-starting motor comprising:

a shaft of non-magnetic material;

a permanent magnet disk mounted on said shaft and having a direction of magnetization parallel to the axis of said shaft;

a pair of starting disks of current conducting material mounted on said shaft one on each side of said permanent magnet disk;

a pair of pole pieces of flux conducting material mounted on said shaft and surrounding said starting disks, said pole pieces each having claw-shaped extensions spaced about and extending from the periphery of the pole pieces to extend over the periphery of said magnet and said starting disks, said claw shaped extensions being interlaced with one another to form rotor poles of alternating polarity.

4,388,546

ARRANGEMENT FOR CONTROLLING THE INTERNAL POTENTIAL IN GENERATOR RODS

Wilhelm Schwanzer, Muelheim, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

Filed Jan. 15, 1982, Ser. No. 339,690
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1981, 3102886
Int. Cl.³ H02K 3/40
U.S. Cl. 310—196 7 Claims

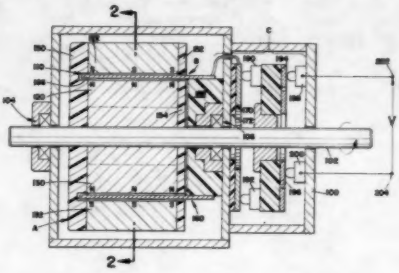
1. Arrangement for controlling the internal potential in generator rods by means of a band consisting of semi-conductive material, which is wound helically around the wire assembly composed of insulated conductor elements, and d-c coupled with one of the conductor elements at a contact point, characterized in that the band is reinforced by several electrically conductive threads spaced in the longitudinal direction of the band, and that the electrically conductive threads are d-c coupled at the contact point with each other and with one conductor element.

4,388,547

CURRENT GENERATOR

John R. Gruber, 1421 E. 32 St., Cleveland, Ohio 44114

Filed Dec. 15, 1980, Ser. No. 216,619
Int. Cl.³ H02K 1/22
U.S. Cl. 310—266 13 Claims



1. A dynamoelectric apparatus comprising:

(a) a plurality of pairs of magnetic pole members disposed at angular intervals along a closed path, each pair of magnetic pole members including magnetic pole members of opposite polarity disposed in a spaced relationship such that a gap is defined therebetween, each pair of magnetic pole member producing magnetic flux lines therebetween, whereby the magnetic flux lines across the gap defined between each pair of magnetic pole members;

(b) a plurality of non-ferrous, conductive segments disposed to pass between the magnetic pole members of each pairs, the conductive segments each having one end thereof electrically connected in common;

(c) means for allowing relative movement between the pairs of magnetic pole members and the conductive segments such that the conductive segments pass cyclically between the magnetic pole members of each pair, whereby the flux lines are cut by the conductive segments inducing electrical currents therein; and,

(d) an electrical connecting circuit operatively connected with the other end of the conductive segments for connecting more than two conductive segments electrically in series for all positions of the conductive segment relative to the magnetic pole members, the electrical connecting circuit including a plurality of diodes which interconnect the conductive segment other ends.

4,388,548

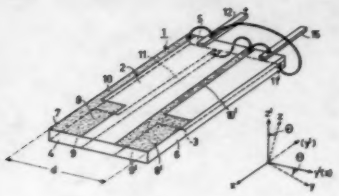
MULTIPLE MODE PIEZOELECTRIC RESONATOR

Daniel C. L. Vangheluwe, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 19, 1981, Ser. No. 225,958
Claims priority, application Netherlands, Jan. 17, 1980, 8000297
Int. Cl.³ H01L 41/08
U.S. Cl. 310—365 8 Claims

1. A piezoelectric resonator comprising a substantially rectangular body cut from a piezoelectric crystal to form first and second major surfaces parallel to each other and two opposed end faces bounding said major surfaces with the body exhibiting a crystal cut rotated about the X-axis, said major surfaces being perpendicular to the Z' axis and the end faces being perpendicular to the X or Y' axis, an electrode array provided on the first and second major surfaces in the direct vicinity of one of said two bounding end faces and arranged so that a

combined resonant mode of vibration is produced in the body comprising an XY′ thickness-shear vibration and a thickness



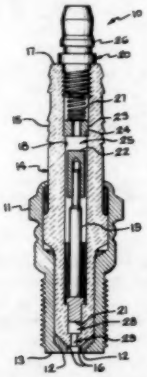
vibration in the X or Y′ direction, and wherein said body is adapted to be supported in the vicinity of the other one of said two end faces.

4,388,549

PLASMA PLUG

Richard W. Bensman, Toledo, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Nov. 3, 1980, Ser. No. 203,270
Int. Cl.³ H01T *13/20*
U.S. Cl. 313—138 **4 Claims**



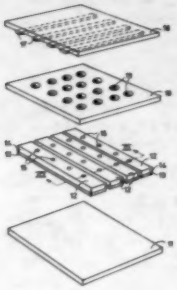
1. A plasma plug for use with an ignition system which, when energized, applies to the plug a high voltage ionizing discharge followed by a lower voltage, high energy discharge, said plug comprising a shell engagable with an internal combustion engine, an annular ground electrode structurally integral with said shell, an insulator mounted in said shell, and a center electrode seated within said insulator, said center electrode and said insulator both having firing ends, the former of which is short of the latter and in spark gap relationship with said ground electrode, said insulator having a stepped cavity extending from the firing end of said center electrode through the firing end of said insulator, the stepped cavity including a cavity of relatively large cross section and a cavity of smaller cross section extending through the firing end of said insulator, the large cavity having an upper portion adjacent the firing end of said center electrode and a lower portion adjacent the smaller cavity, the ratio of the volume of the large cavity to that of the smaller being from about 100:1 to about 1:1, and the ratio of the length of the large cavity to that of the smaller being from about 1:3 to about 1:1, whereby a jet of plasma is emitted generally longitudinally from the cavity of said insulator when the plug is energized by successive high voltage and high energy discharges.

4,388,550

GAS DISCHARGE DISPLAY PANEL HAVING HOLLOW CATHODES

Gerhard H. F. de Vries, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 1, 1980, Ser. No. 192,745
Claims priority, application Netherlands, Oct. 10, 1979, 7907489
Int. Cl.³ H01J *61/08, 61/30*
U.S. Cl. 313—585 **9 Claims**



1. A gas discharge display panel comprising a plurality of display anode conductors,

a cathode conductor having at least a row-wise series of hollow cathodes, each of said hollow cathodes being a cavity with a first aperture opposite to a respective display anode conductor, wherein said cathode conductor consists of at least one first metal strip and at least one second metal strip extending on and along said first metal strip, said second metal strip having a row-wise series of said first apertures opening toward said first metal strip, and wherein said hollow cathodes are disposed between said first metal strip and said second metal strip at said first apertures,

at least one row of selectively ignitable gas discharge cells disposed between said plurality of display anode conductors and said cathode conductor,

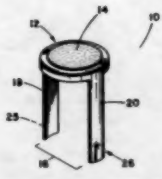
wherein said hollow cathodes extend by a transverse dimension a parallel to said cathode conductor and away from said anode conductors by a depth dimension b where $a > b$.

4,388,551

QUICK-HEATING CATHODE STRUCTURE

Francis M. Ray, Schaumburg, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 24, 1980, Ser. No. 209,575
Int. Cl.³ H01J *1/14, 19/06*; H01K *1/04*
U.S. Cl. 313—346 R **3 Claims**



1. For use in a cathode ray tube electron gun, a onepiece directly heated cathode comprising:

a thermionic electron-emissive coating; and

a support structure for said coating comprising a portion of an open-ended hollow cylindrical body having a closed end for receiving and supporting said coating,

said closed end having an integral pair of body sections extending axially in the same direction from diametrically opposed sides of said closed end to define two parallel legs that constitute, in conjuncton with said closed end, an electrically conductive path that exhibits an inherent resistance to an electrical current to generate heat for transfer to said coating,

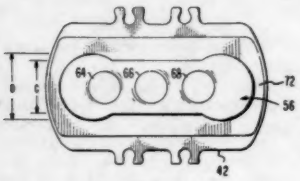
said legs having an arcuate cross-section effective to structurally stabilize said cathode and suppress temperature-induced lateral displacement of the support structure which would otherwise degrade performance of said electron gun.

4,388,552

COLOR PICTURE TUBE HAVING AN IMPROVED EXPANDED FOCUS LENS TYPE INLINE ELECTRON GUN

Paul T. Greninger, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 10, 1981, Ser. No. 282,228
Int. Cl.³ H01J *29/50, 29/62*
U.S. Cl. 313—414 **2 Claims**



1. In a color picture tube having an inline electron gun for generating and directing three electron beams, a center beam and two side beams, along coplanar paths toward a screen of said tube, said gun including a main focus lens for focusing said electron beams, the main focus lens being formed by two spaced electrode members each having three separate inline apertures therein, each electrode also including a peripheral rim, the peripheral rims of the two electrodes facing each other, and the apertured portion of each electrode being within a recess set back from the rim, the improvement comprising

the width of the recess at least at the rim in at least one of the electrodes being wider at the side beam paths than at the center beam path, measured perpendicular to the plane containing the electron beam paths.

4,388,553

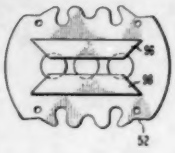
COLOR PICTURE TUBE HAVING AN EXPANDED FOCUS LENS TYPE INLINE ELECTRON GUN WITH AN IMPROVED STIGMATOR

Hsing-Yao Chen, Landisville, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 10, 1981, Ser. No. 282,230
Int. Cl.³ H01J *29/50, 29/62*
U.S. Cl. 313—414 **5 Claims**

1. In a color picture tube having an inline electron gun for generating and directing three electron beams, a center beam and two side beams, along coplanar paths toward a screen of said tube, said gun including a main focus lens for focusing said electron beams, the main focus lens being formed by two spaced electrode members each having three separate inline apertures therein, each electrode also including a peripheral rim, the peripheral rims of the two electrodes facing each other, and the apertured portion of each electrode being within a recess set back from the rim, the improvement comprising

the main focus lens electrode closest to said screen including a slot on the side facing the screen, said slot extending in the inline direction of the three electron beam paths and



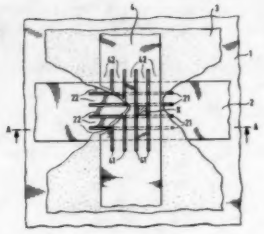
including means for providing a weaker stigmator effect on the two side beams than on the center beam.

4,388,554

ELECTROLUMINESCENT DISPLAY COMPONENT

Tuomo Suntola, and Jorma O. Antson, both of Espoo, Finland, assignors to Oy Lohja Ab, Virkkala, Finland

Filed Jun. 11, 1981, Ser. No. 272,787
Claims priority, application Finland, Aug. 20, 1980, 802628
Int. Cl.³ H01J *1/62*
U.S. Cl. 313—505 **4 Claims**



1. An improved electroluminescent display component comprising a substrate having successive layers disposed thereon, including a film-type first electrode, an electroluminescent layer, and a second film-type electrode, the improvement comprising an arrangement of said first and second electrodes wherein opposed areas of said respective electrodes are divided into strips by means of elongated gaps disposed side by side over the extent of such opposed areas of each said first and second electrodes, said gaps being arranged in said first electrode in a diverging relationship with respect to the said gaps in said second electrode.

4,388,555

GYROTRON WITH IMPROVED STABILITY

Robert S. Symons, Los Altos, and Howard R. Jory, Menlo Park, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

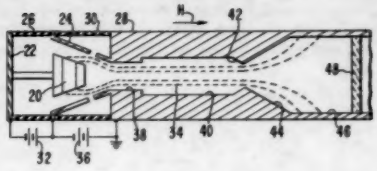
Filed Mar. 9, 1981, Ser. No. 241,880
Int. Cl.³ H01J *25/00*
U.S. Cl. 315—4 **8 Claims**

1. A gyro-device microwave generator comprising: means for generaing a beam of charged particles following helical paths,

circuit means for supporting at a selected operating frequency an electromagnetic wave in a higher order mode having a transverse electric field component for interaction with the transverse velocity component of said particles,

a wave isolating aperture on at least one end of said circuit means,

said circuit means and said aperture being hollow to provide longitudinal passage of said beam,



the improvement being the maximum inner diameter a of said aperture being less than 8.8/f where a is the diameter in centimeters and f is the frequency of said wave in gigahertz.

4,388,556

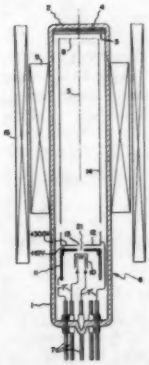
LOW NOISE ELECTRON GUN

Nidamboor V. Rao, Cumberland, R.I., assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 11,468, Feb. 12, 1979, which is a continuation-in-part of Ser. No. 877,080, Feb. 13, 1978. This application Feb. 6, 1981, Ser. No. 232,350

Int. Cl.³ H01J *29/46, 29/56*

U.S. Cl. 315—14 **10 Claims**



1. An electron gun for generating an electron beam comprising a cathode, a first electrode spaced from said cathode along an axis extending through said cathode, said first electrode having an aperture generally concentric with said axis, means for applying to said first electrode a first voltage which is positive with respect to and is sufficient to extract electrons from said cathode, a second electrode spaced from said first electrode along said axis and means for applying to said second electrode a second voltage which is positive with respect to said cathode and is sufficiently higher than said first voltage to produce an electric field in the region between said first and second electrodes defining an electron lens for converging the electrons emitted from said cathode to a cross-over in said region, said second electrode having formed therein a beam limiting aperture generally concentric with said axis for passing said electrons therethrough to thereby produce said electron beam of a cross-section determined by the size of said beam limiting aperture.

4,388,557

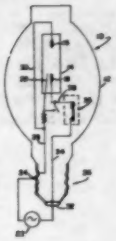
HIGH INTENSITY DISCHARGE LAMP INCLUDING ARC EXTINGUISHING MEANS

John W. Shaffer, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 16, 1981, Ser. No. 244,432

Int. Cl.³ H01J *7/44, 17/34, 23/16, 29/96;* **H01K** *1/62*

U.S. Cl. 315—74 **5 Claims**



1. In a high intensity discharge lamp comprising an arc discharge tube mounted within an outer envelope enclosing a substantially oxygen-free environment, electrical circuitry for said lamp and arc extinguishing means operative to interrupt electrical power to said arc discharge tube in the event of rupture of said outer envelope, said arc extinguishing means comprising: a serially connected switch associated with said circuitry for said lamp, said switch comprising a bimetallic, layered element of at least two materials, a first of said materials being substantially resistant to oxidation and a second of said materials being relatively rapidly oxidizable, whereby, in the event of atmospheric oxygen being admitted within said outer envelope, said second of said materials will combine with said oxygen and grow dimensionally to an extent to cause permanent flexure of said switch, thereby opening said circuitry and extinguishing said lamp.

4,388,558

DISPLAY INTENSITY CONTROL APPARATUS

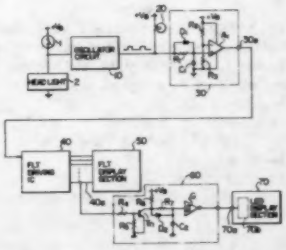
Tooru Mizuno, Nagoya, and Yasuo Hagisato, Toyota, both of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 17, 1981, Ser. No. 322,297

Claims priority, application Japan, Nov. 20, 1980, 55-164367

Int. Cl.³ H01K *7/00*

U.S. Cl. 315—77 **8 Claims**



1. A display intensity control apparatus for a display system of an automobile including a plurality of display units having display means of different types, respectively, said apparatus comprising:

switch means adapted to be turned on under dark ambient conditions;

pulse generating means responsive to turning on of said

switch means to generate a first pulse signal with a predetermined duty ratio at a predetermined frequency for controlling an average intensity of a first one of said display means in accordance with said duty ratio; and

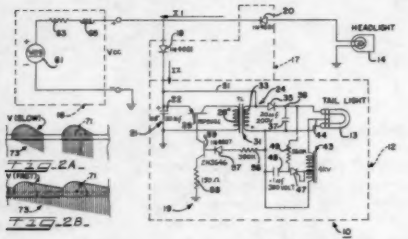
duty ratio converting means for changing said duty ratio of said first pulse signal to generate a second pulse signal having the changed duty ratio for controlling an average intensity of a second one of said display means in accordance with said changed duty ratio.

4,388,559

BICYCLE LIGHTING SYSTEM

David W. Lefavour, 3144 Jacquline Dr., Rockford, Ill. 61101

Filed Jul. 17, 1980, Ser. No. 169,650
Int. Cl.³ H05B *41/34, 35/00*
U.S. Cl. 315—78 **12 Claims**



1. In a lighting system having a source of alternating current adapted to be driven mechanically by a bicycle or the like when it is propelled along the ground and having an incandescent lighting device energizable electrically by the source, strobe lighting apparatus comprising:

a flash tube for producing successive high intensity bursts of light;

energy converting means for supplying a train of high voltage pulses for energizing repeatedly said flast tube; and

an impedance matching arrangement including first unidirectional means for coupling the output of the source of said energy converting means for energizing it periodically during half cycles of the alternating current output of the source, and second unidirectional means for coupling the output of the source to the lighting device to energize it during the alternate half cycles of the source.

4,388,560

FILAMENT DISPENSER CATHODE

William P. Robinson, Newbury Park; Hugh McNulty, Jr., Santa Monica; Robert L. Seliger, Agoura, and Weldon S. Williamson, Malibu, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed May 26, 1981, Ser. No. 266,772
Int. Cl.³ H01J *3/04, 27/26*
U.S. Cl. 315—111.81 **12 Claims**

1. A discharge chamber;

an ion source within said discharge chamber, said ion source comprising:

a housing;

an anode within said housing;

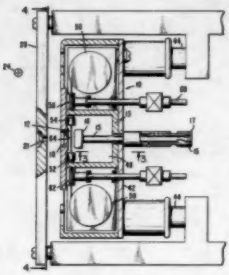
an ion outlet opening from said housing;

supply means for supplying ion fuel feed gas to said housing;

a cathode positioned between said anode and said ion outlet opening from said housing, said cathode comprising an elongated metallic coil strip;

drive means comprising a pair of motor driven take-up wheels engaged with said strip for advancing said strip from a source to a separate waste region by applying advancing force separately from said source and waste region for advancing said strip;

a Penning discharge chamber connected to said ion outlet opening from said housing to receive ionized feed gas therein, said Penning discharge chamber having an anode surrounding said chamber, and having a screen outlet, an



accelerator electrode positioned beyond said screen electrode to accelerate ions from said Penning plasma discharge chamber to produce an ion stream; and

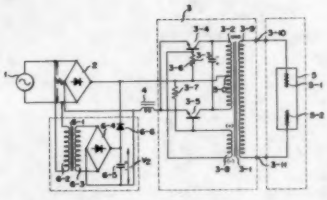
a target chamber connected to receive accelerated ions form said accelerator electrode, and to contain a target therein for bombardment from said accelerated ion stream.

4,388,561

APPARATUS FOR OPERATING DISCHARGE LAMPS

Yasunobu Koshimura, Tokyo; Hisao Kobayashi, Fujisawa, and Nanjou Aoike, Yokohama, all of Japan, assignors to Toshiba Electric Equipment Corporation, Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 237,269
Int. Cl.³ H05B *41/29*
U.S. Cl. 315—171 **5 Claims**



1. Appparatus for operating a discharge lamp comprising:

rectifying means for rectifying a low frequency AC voltage to obtain a pulsating voltage;

an auxiliary power source for generating an auxiliary voltage;

a switch circuit for adding said auxiliary voltage to said pulsating voltage in order to produce a resultant voltage only when said pulsating voltage is lower than said auxiliary voltage, with the minimum value V_{min} of the resultant voltage and the maximum value V_{max} of said resultant voltage being set to meet a condition such that $\frac{1}{2}V_{max} \geqq V_{min} \geqq \frac{1}{4} V_{max}$;

an inverter for inverting said added auxiliary voltage and pulsating voltage to a high frequency voltage; and

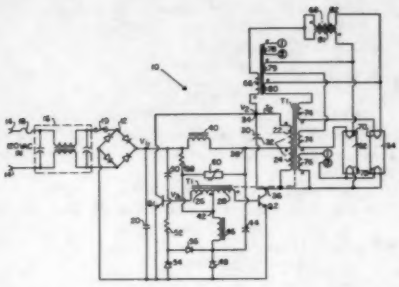
means for operating a discharge lamp according to the output of said inverter.

4,388,562

ELECTRONIC BALLAST CIRCUIT

Elliot Josephson, Los Altos, Calif., assignor to Astec Components, Ltd., Santa Clara, Calif.

Filed Nov. 6, 1980, Ser. No. 204,561
Int. Cl.³ H05B *37/00, 39/00, 41/14*
U.S. Cl. 315—205 **13 Claims**



1. A sine wave converter power supply comprising:

rectifier means for converting an AC input voltage to an unsmoothed DC voltage;

converter means operatively connected to receive said unsmoothed DC voltage and to function over the range of DC voltages produced by said rectifier means extending from substantially zero volts to at least the peak amplitude of the AC input voltage to said rectifier means, said means including a tank circuit including a capacitor connected in parallel with an inductor, for producing from said unsmoothed DC voltage a high frequency alternating output voltage of sufficient amplitude to power one or more fluorescent lamps or the like, said means further including two transistors, each including a base, emitter and collector, said transistors connected such that one transistor is normally off while the other transistor is normally on, and means for alternately turning on each of said transistors, said means for turning on comprising current source means capacitively fed from said tank circuit for generating a base current of sufficient amplitude to turn on one of said transistors, and steering means for coupling said base current alternately to the base of each said transistor;

means for preventing breakdown across either transistor; and

current limiting means to limit the current supplied by said converter means to each said lamp when said lamp is on.

4,388,563

SOLID-STATE FLUORESCENT LAMP BALLAST

Tom M. Hyltin, Dallas, Tex., assignor to Commodore Electronics, Ltd., Nassau, The Bahamas

Filed May 26, 1981, Ser. No. 267,354
Int. Cl.³ H05B *37/00*
U.S. Cl. 315—205 **12 Claims**

1. A solid-state dimmable fluorescent lamp ballast circuit comprising:

rectification means for supplying a unipolar electrical voltage;

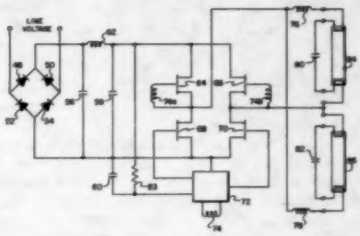
a first switch adapted to couple a first side of the output of said rectification means to one side of a gaseous discharge lamp;

a second switch adapted to couple said first side of the output of said rectification means to the other side of a gaseous discharge lamp;

a third switch adapted to couple a second side of the output of said rectification means to said one side of a gaseous discharge lamp;

a fourth switch adapted to couple said second side of the output of the said rectification means to said other side of a gaseous discharge lamp;

control means for providing first and second complementary pulse trains and third and fourth variable duty cycle pulse trains, said first pulse train being coupled to said first switch, said second pulse train being coupled to said second switch, said third pulse train being coupled to said third switch and said fourth pulse train being coupled to said fourth switch wherein said fourth switch is closed for a variable percentage of the time said first switch is closed and said third switch is closed for a variable percentage of the time said second switch is closed, said control means comprising:



oscillator means for providing an output having a first frequency;

multiple stage divider means coupled to said oscillator means for providing an output at a second frequency;

first means coupled to the output of said multiple stage divider for providing said first and second pulse trains;

second means selectively coupled to at least one intermediate stage of said multiple stage divider for providing said third and fourth pulse trains; and

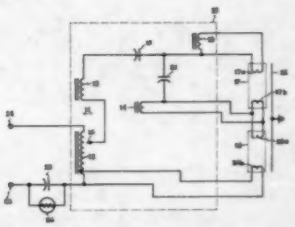
means for varying the duty cycle of third and fourth pulse trains.

4,388,564

ENERGY SAVING FLUORESCENT LAMP CIRCUIT

Edward E. Hammer, Mayfield Village, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1981, Ser. No. 241,922
Int. Cl.³ H05B *41/16*
U.S. Cl. 315—227 R **1 Claim**

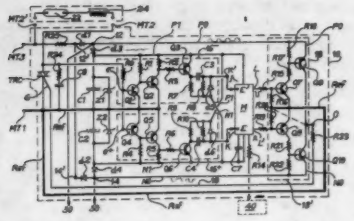


1. A fluorescent lamp operating circuit comprising a ballast circuit enclosed in a housing and having conductors externally of the housing for connection to an electrical power source, wherein the improvement comprises a capacitor connected in series with one of said conductors externally of said housing, thereby reducing electrical power to the circuit, and a positive temperature coefficient resistor connected across said capacitor.

4,388,565
CONTROL CIRCUIT FOR A DISCHARGE LAMP

Jan Rividi, Paris, France, assignor to Elam Limited, Dublin, Ireland

Filed Dec. 18, 1980, Ser. No. 217,868
Claims priority, application France, Dec. 19, 1979, 79 31108
Int. Cl.³ H05B *41/392*
U.S. Cl. 315—291 **13 Claims**

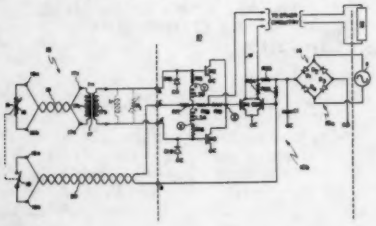


1. A control device for a discharge lamp, comprising an electronic switch having a control electrode and connected between a terminal for connection, with an AC supply source, and a terminal for connection with a loading circuit including the discharge lamp to be controlled, and a control circuit for delivering control pulses applied to said control electrode for controlling the state of said switch, wherein said comprises a circuit for detecting the passages through zero of the voltage at the terminals of said loading circuit, generating means connected to said detecting circuit and responsive to passages through zero of the current through said discharge lamp for providing control pulses having an adjustable duration and means for receiving said control pulses and connected to said control electrode for maintaining the electronic switch in a non-conductive state during the duration of said control pulses.

4,388,566
PASSIVE CONTROL NETWORK FOR REMOTE CONTROL OF LOAD OUTPUT LEVEL

James F. Bedard; Charles W. Eichelberger, both of Schenectady, N.Y., and De-Yu Chen, Blacksburg, Va., assignors to General Electric Company, New York, N.Y.

Filed Feb. 17, 1981, Ser. No. 235,191
Int. Cl.³ G05F *1/00*
U.S. Cl. 315—291 **13 Claims**

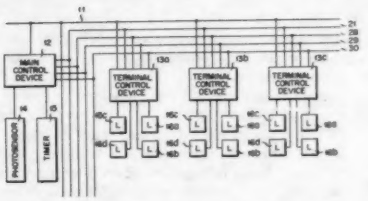


1. Power load control apparatus comprising:
(a) a load circuit adapted to supply an alternating current of variable frequency to an electrical load;
(b) said load circuit comprising input terminals and means for providing a periodic waveform across said input terminals;
(c) a transformer comprising a primary winding and a secondary winding;
(d) said primary winding being connected in circuit with said input terminals;
(e) a variable impedance element;
(f) a passive circuit comprising said variable impedance element in circuit with said secondary winding and energized by the periodic waveform coupled by the transformer from said input terminals;
(g) said load circuit being adapted to vary the frequency of the alternating current adapted to be supplied to a load as a function of the magnitude of the impedance reflected by the variable impedance element to the input terminals whereby adjustment of the impedance magnitude of the variable impedance element controls the frequency of the alternating current adapted to be supplied by the load circuit to an electrical load.

4,388,567
REMOTE LIGHTING-CONTROL APPARATUS

Kyoji Yamazaki, Urawa, and Fumio Kamiya, Yokohama, both of Japan, assignors to Toshiba Electric Equipment Corporation, Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 238,089
Claims priority, application Japan, Feb. 25, 1980, 55-22613
Int. Cl.³ H05B *37/02*
U.S. Cl. 315—291 **7 Claims**



1. A remote lighting-control apparatus which comprises:
a main control device provided with means for transmitting selectively address data and any of a plurality of mode data and a lighting-control data generating section which generates a plurality of lighting-control data corresponding to said mode data, said main control device transmitting separately the lighting-control data and a group of the address and mode data; and
a plurality of terminal control devices, each of which comprises means for receiving the address and mode data, means for selecting the lighting-control data in accordance with the mode data, and means for controlling the lighting of at least one lighting load in accordance with the contents of a lighting-control data selected by the signal-selecting means.

4,388,568
LINE END STAGE INCLUDING TRANSFORMER FOR A TELEVISION RECEIVER

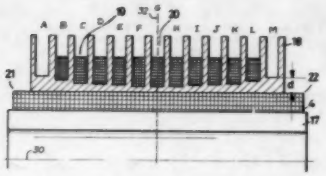
Walter Goseberg; Alfred Pollak, and Wolfgang Reichow, all of Hanover, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 31, 1980, Ser. No. 202,730
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944220
Int. Cl.³ H01J *29/80*; H01F *27/30, 27/24, 27/32*
U.S. Cl. 315—411 **10 Claims**

1. In a television receiver having line sweep coils and a picture tube, a line end stage comprising
a transformer coupled to said line sweep coils including
a core having a longitudinal axis;
a single continuous untapped primary winding mounted on said core, said primary winding being coaxial with said longitudinal axis;
an insulating winding form surrounding said single primary winding, said winding form being coaxial with said longitudinal axis and being provided with spaced

longitudinally-distributed radially-extending chambers; and

a single continuous untapped secondary winding located within the chambers of said winding form, the distances between the bottoms of the chambers within said winding form and said primary winding decreasing from the ends of said winding form toward the center thereof along said longitudinal axis;



a first high voltage rectifier having its anode connected to ground and its cathode connected to one end of said secondary winding; and

a second high voltage rectifier having its anode connected to the other end of said secondary winding and its cathode connected to the anode of said picture tube.

4,388,569

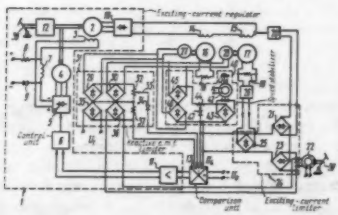
SYSTEM FOR AUTOMATIC CONTROL OF DYNAMIC BRAKING OF INDEPENDENT TRANSPORT FACILITY

Gennady A. Shipaev, ulitsa Magnitogorskaya, 27, kv. 96; Vyacheslav V. Seliverstov, 2 Dorozhny proezd, 16, korpus 1, kv. 67; Nikolai A. Osipov, ulitsa Tkatskaya, 28/14, kv. 116; Anatoly P. Prolygin, ulitsa Trofimova, 2/1, kv. 130; Anatoly D. Mashikhin, ulitsa Marshala Timoshenko, 28, kv. 45; Mikhail P. Askinazi, ulitsa Trifonovskaya, 60, korpus 2, kv. 73; Jury M. Andreev, Nagatinskaya ulitsa 15, korpus, 1, kv. 53, all of Moscow, and Samuil I. Kagan, ulitsa 40 let Oktyabrya, 31, kv. 62, Zhodino, Minskaya oblast, all of U.S.S.R.

Filed Sep. 24, 1981, Ser. No. 307,944

Int. Cl.³ H01P *3/00*

U.S. Cl. 318—87 **4 Claims**



1. A system for automatic control of dynamic braking of an independent transport facility comprising: traction motors with field windings; a traction-motor exciting-current regulator whose output is connected to said field windings of said traction motors; rotational-speed transducers associated with said traction motors; a traction-motor reactive e.m.f. limiter whose input is coupled to the output of said rotational-speed transducer; a voltage transducer associated with at least one of said traction motors; an exciting-current transducer of associated with at least one said traction motors; a traction-motor exciting-current and brake-horsepower limiter formed with at least a first set of three interconnected rectifying bridges, outputs of two of said first set of rectifying bridges being connected in series and connected to the output of the third of said first set of rectifying bridge; a first input of said traction-motor exciting-current and brake-horsepower limiter being coupled to the output of said voltage transducer; while a second input thereof is connected to said exciting-current transducer; a braking intensity setter connected to a third input of said traction-motor exciting-current and brake-horsepower limiter; a comparison unit having its first input connected to the output of said traction-motor exciting-current and brake-horsepower limiter and its second input coupled through a diode to said traction-motor reactive e.m.f. limiter, the output of the comparison unit being connected to the input of said traction-motor exciting-current regulator.

4,388,570

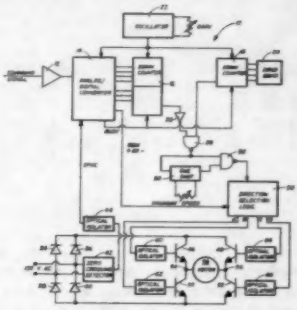
DIGITALLY CONTROLLED PULSE WIDTH MODULATED MOTOR SPEED CONTROL FOR SERVO POSITIONING SYSTEMS

Neal V. Sangree, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 16, 1981, Ser. No. 244,493

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—255 **8 Claims**



1. A pulse width modulated control system for positioning a servo device in response to an analog feedback signal indicative of the actual position of the servo device comprising:

means for converting said analog feedback signal into a digital signal; having a first and second total number of predetermined bits;

first counter means for receiving said digital signal of predetermined bits of said first total from said converting means and counting downward through said first total of predetermined bits and establishing a first control signal thereafter;

second counter means for receiving said digital signal of predetermined bits of said second total number less than said first total and counting downward through said predetermined bits of said second total and establishing a second control signal thereafter;

means for supplying power to said servo device;

means for controlling the transmission of power from said power supplying means to said servo device; and

circuit means responsive to said first and second control signals for selectively actuating said controlling means to regulate the operation of said servo device.

4,388,571

CONTROL CIRCUIT FOR AUTOMOBILE ELECTRO-MAGNETIC DRIVING EQUIPMENT

Yoshiharu Tada, and Yuichi Kitano, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1981, Ser. No. 335,158

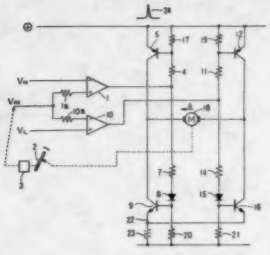
Claims priority, application Japan, Apr. 13, 1981, 56-55398

Int. Cl.³ G05B *9/02*

U.S. Cl. 318—293 **5 Claims**

1. Control circuit for automobile electro-magnetic driving equipment comprising in combination of a first transistor con-

nected to a power supply, a second transistor connected to an earth and connected in series to said first transistor, a third transistor connected to the power supply, a fourth transistor connected to the earth and connected in series to said third transistor, an automobile electro-magnetic driving equipment connected between a common junction point of said first and second transistors and a common junction point of said third and fourth transistors, a first control circuit for transmitting either a high level or low level output to each of the bases of said first and second transistors, turning on either one of the first and second transistors and turning off the other thereof, and a second control circuit for transmitting either a high level or low level output to each of the bases of said third and fourth transistors, turning on either one of the third and fourth transistors and turning off the other thereof wherein both normal and reverse electric currents are fed to said automobile electro-



magnetic driving equipment by turning on the first transistor or the fourth transistor or by turning on the second transistor and the third transistor in reference to the outputs from said first and second control circuits characterized in that the same is provided with a first short-circuited prevention transistor in which said first transistor is held off when said second transistor is kept on and the first transistor is reversed from its off condition to its on condition by making a delay of a specified period from the reversing time when the second transistor is reversed from its on condition to its off condition, and a second short-circuit prevention transistor in which said third transistor is held off when the fourth transistor is kept on and the third transistor is reversed from its on condition to its off condition by making a delay of a specified period from the reversing time when the fourth transistor is reversed from its on condition to its off condition.

4,388,572

CONSTANT SPEED REGULATOR FOR DC MOTORS

Wolfgang Rosenfeldt, Bad Bergzabern, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.

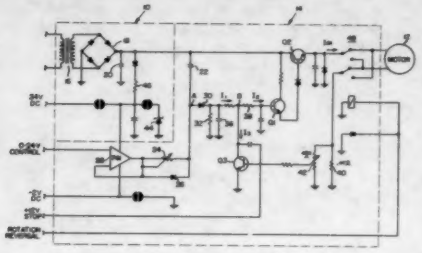
Filed May 15, 1980, Ser. No. 150,051
Int. Cl.³ H02P 5/16
U.S. Cl. 318—317 **1 Claim**

1. An open loop speed regulator for use with a direct current motor comprising:

an AC to DC rectifier circuit including a shunt capacitor;

means for measuring AC ripple across the capacitor;

a control circuit for supplying a variable magnitude DC input voltage to a DC motor, the control circuit being connected to said rectifier circuit and being responsive to the magnitude of AC ripple across the capacitor so as to increase the magnitude of DC input voltage to the DC



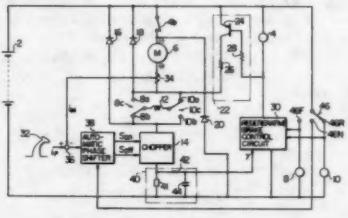
motor as a function of increase of the magnitude of AC ripple.

4,388,573

ELECTRIC VEHICLE CONTROL DEVICE

Michimasa Horiuchi; Masahiko Ibamoto, both of Katsuta, and Kiyoshi Nemoto, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1981, Ser. No. 254,295
Claims priority, application Japan, Apr. 16, 1980, 55-49187
Int. Cl.³ H02P 3/14
U.S. Cl. 318—376 **4 Claims**



1. An electric vehicle control device comprising:

a main circuit for supplying power from a d.c. power supply to a driving motor through a chopper;

a phase shifter for controlling the conduction ratio of said chopper in such a manner that a current flowing through said driving motor is proportional to an instruction value, said instruction value being determined by how much an accelerator pedal is trodden;

means for instructing a regenerative braking operation;

changeover means for changing over said main circuit between a power running state and a regenerative braking state;

conduction-ratio detecting means for detecting that the conduction ratio of said chopper in said power running state exceeds a preset value, to deliver an output while the conduction ratio exceeds the preset value;

holding means for holding and delivering said output of said conduction-ratio detecting means for a predetermined time; and

means for placing said changeover means on the regenerative braking side in response to the presence of both of the output of said holding means and the output of said means for instructing said regenerative braking operation.

4,388,574

CONTROL CIRCUIT FOR VARIABLE-SPEED WINDSHIELD WIPER

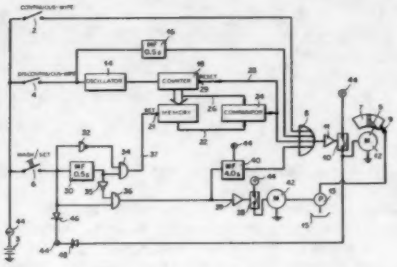
Wilhelm Bois, Gaimersheim, and Josef Büchl, Lenting, both of Fed. Rep. of Germany, assignors to Audi NSU Auto Union AG, Neckarsulm, Fed. Rep. of Germany

Filed Apr. 30, 1981, Ser. No. 259,095

Claims priority, application Fed. Rep. of Germany, May 10, 1980, 3017982

Int. Cl.³ H02P 1/04

U.S. Cl. 318—443 **10 Claims**



1. In combination with a windshield wiper operated by a motor powered in turn from an electric source, a control circuit comprising:

continuous-wipe switch means connected between said source and said motor and closable for continuous operation of said wiper by said motor;

a discontinuous-wipe switch having a first side connected to said source and a second side;

an oscillator connected to the second side of said discontinuous-wipe switch and powerable therethrough by said source to oscillate;

resettable counter means connected to said oscillator for counting synchronously as same oscillates and for generating a correspondingly changing numerical output;

a settable memory connected to said counter means for generating a fixed numerical output;

circuit means connected between said memory, said motor, and said counter means for energizing said motor and resetting said counter means when said numerical outputs are equal to each other; and

means including a set switch operable to establish in said memory as said fixed numerical output the numerical output of said counter generally at the instant when said set switch is operated.

4,388,575

ARRANGEMENT FOR CONTROLLING ELEMENTS OF POWER VEHICLE SUCH AS SAFETY BELT, WINDOW PANE AND THE LIKE

Cornelia Lungu, Bühlertal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

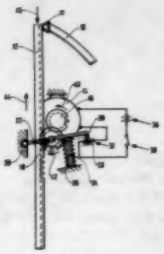
Filed Feb. 1, 1982, Ser. No. 344,778

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111919

Int. Cl.³ G05B 5/00

U.S. Cl. 318—475 **8 Claims**

1. An arrangement for controlling an equipment part of a power vehicle, comprising a displaceable member connectable with a power vehicle element to be controlled and displaceable together with the latter from a first end position to a second end position in a predetermined direction; means for driving said displaceable member; and safety means arranged to interrupt a power flux from said driving means to said displaceable member when a resistance beyond a limiting value acts upon said displaceable member in a direction opposite to said predetermined direction, said safety means including a withdrawable toothed wheel connected with a lever pivotable so that in the event of a resistance beyond the limiting value said toothed wheel is withdrawable from the power flux and thereby the displacement of said displaceable member is interrupted, whereas in the event of a resistance within the limiting value



said toothed wheel is retained in the power flux by a force adjustable in correspondence with the limiting value and thereby the displacement of said displaceable member is sustained; and means for retaining said toothed wheel in the power flux by a force adjustable in correspondence with the limiting value.

4,388,576

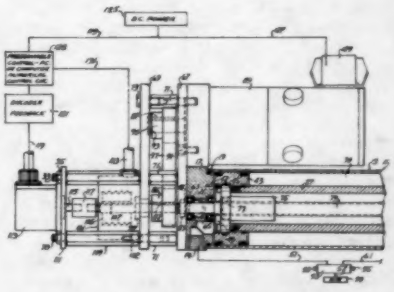
ELECTRIC SERVO DRIVE AIR CYLINDER

Leland F. Blatt, P.O. Box 220, Fraser, Mich. 48026

Filed Sep. 23, 1981, Ser. No. 304,794

Int. Cl.³ G05B 19/24

U.S. Cl. 318—571 **15 Claims**



1. An electronic servo-drive air cylinder comprising a cylinder tube having a blind end cap with a first pressure port and a rod end cap with a second pressure port;

a tubular piston rod sealed within said cylinder and projecting through said rod end cap terminating in a rod end adapted for connection to a load to be reciprocated;

a reciprocal piston in said tube secured to said piston rod;

a ball nut axially mounted upon said piston rod adjacent said piston;

a ball screw axially threaded through said nut and extended substantially the length of said piston rod and at one end slidably supported thereon, its other end extending through said piston and blind end cap and outwardly thereof;

a D.C. motor mounted upon said blind end cap having a drive shaft;

and drive means interconnecting said drive shaft and ball screw;

said cylinder ports adapted for alternate connection to a source of pressurized air, whereby pneumatic pressure

supports a variety of piston rod loads, and the motor operated ball screw controls the piston rod and accurately positions said rod at any increment of extension or retraction.

4,388,577

ROTATING FIELD MACHINE DRIVE

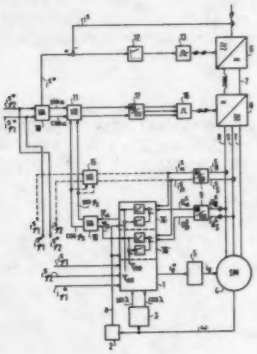
Felix Blaschke, and Theodor Salzmann, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,352

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026202

Int. Cl.³ H02P 5/40

U.S. Cl. 318—717 **9 Claims**



1. A rotating field machine drive comprising:

(a) a frequency converter;

(b) a rotating field machine fed by the converter;

(c) first and second a-c voltage integrators, each comprising an integrator having as an input a component of the EMF vector of the machine formed by the stator current and stator voltage and an output which is a corresponding component of the magnetic flux vector of the machine, a feedback line connecting the integrator output with the integrator input, with a zero controller in said feedback line;

(d) a converter control coupled to the outputs of the a-c voltage integrators having as inputs nominal values for control of the stator current component parallel to the flux vector and of the component normal thereto;

(e) a computing model circuit energized by a voltage corresponding to the stator current and to the rotor position, which computing model circuit simulates mathematically the processes that lead to the development of the machine flux and determines, by means of the rotor position, model quantities for the flux components; and

(f) means for adding the flux component model quantities onto the inputs of the zero controllers such that each zero controller eliminates dc-component in the difference between the flux component determined at the correlated a-c voltage integrator and the model quantity for this flux component.

4,388,578

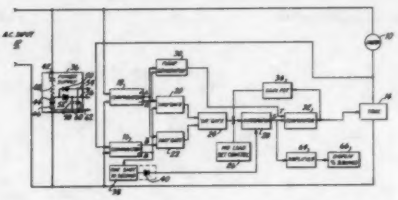
POWER FACTOR CONTROLLER

Dan Green, Cranford, N.J., and Sandor Goldner, Brooklyn, N.Y., assignors to Cynex Manufacturing Corporation, Hillside, N.J.

Filed Jul. 7, 1980, Ser. No. 166,046

Int. Cl.³ H02P 5/40

U.S. Cl. 318—729 **19 Claims**



1. A power factor controller for an AC induction motor comprising:

a control means adapted to be electrically connected in series with each phase winding of the AC motor for controlling the power to said winding;

circuit means coupled to said control means for providing an output which varies in accordance with the difference in phase between the current through said winding and the voltage across said winding, said phase difference varying with motor loading, and for providing said output to said control means for varying the duration of "on" time of each cycle of input power to said winding in accordance with said phase difference to thereby provide input power to the motor commensurate with the loading on the motor so as to improve efficiency,

start-up means for producing an output signal to said circuit means whereby said circuit means maintains the "on" time of said control means at maximum for a predetermined duration to enable the motor to reach full speed in minimum time, and

means coupled to said start-up means for causing said start-up means to produce its output signal when said motor is initially energized simultaneously with initial energization of said circuit means as well as for causing said start-up means to produce its output signal when said motor is initially energized after said circuit means have already been energized.

4,388,579

CONTROL SYSTEM FOR A WOUND-ROTOR MOTOR

James N. Ellis, Chatsworth, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 17, 1981, Ser. No. 284,158

Int. Cl.³ H02P 5/40

U.S. Cl. 318—732 **15 Claims**

1. In a load switching arrangement for selectively connecting a direct current load to at least first and second taps of a winding of a transformer, a load switching circuit means comprising:

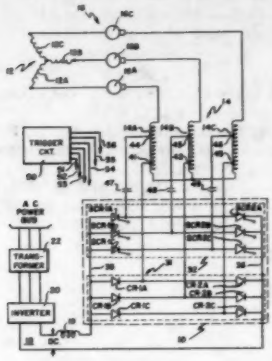
first recitifier means connected to said first tap of said transformer winding and having positive and negative terminals connected to said direct current load;

second normally non-conducting controlled rectifier means connected between said positive and negative terminals in parallel with said first recitifier means;

switch means interposed between said second rectifier means and said second tap of said transformer winding and operable to connect said second recitifer means to said second tap;

and enabling circuit means for initiating conduction of said second rectifier means after said switch means is operated;

said load being connected to said first tap through said first rectifier means when said first rectifier means is conducting, and said load being connected to said second tap through said second rectifier means when said second



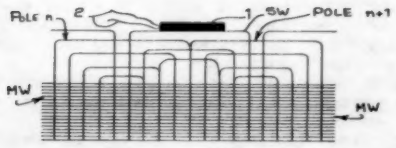
recitifier means is conducting, the potential at said second tap being higher than the potential at said first tap whereby said first rectifier means is rendered non-conducting, disconnecting the load from said first tap, when said second rectifier means is conducting.

4,388,580

MAGNETIC DEVICE FOR CONTROLLING STARTING OF A SINGLE PHASE INDUCTION MOTOR

Antonio Ramirez, 5725 Buade St., St-Leonard, Montreal, Canada (H1S 1E3)

Filed Nov. 16, 1981, Ser. No. 321,580
Int. Cl.³ H02P 1/42
U.S. Cl. 318—787 **6 Claims**



1. A starter device for a single phase A.C. motor having a main winding and a starting winding disposed for connection to a single A.C. source, comprising:

a semiconductor switching device having a control electrode and a transconductive path between two power electrodes;

circuit means for connecting said transconductive path of said semiconductor switching device in series with said single A.C. source, and said starting winding to energize or disconnect said starting winding;

sensing means disposed between two adjacent poles of the main winding of the stator of the motor to sense the magnetic flux forced out of saturated magnetic cores of said two adjacent poles by the initial inrush of current passing through said main winding upon starting of the motor, said sensing means having an axis of detection extending in the direction of the lines of said magnetic flux; and

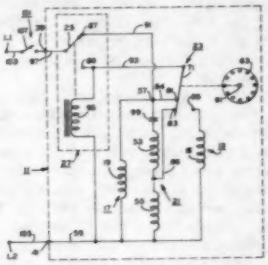
means for connecting said sensing means between said control electrode and one of said power electrodes of said semiconductor switching device, whereby the current induced through said sensing means by the magnetic flux upon starting of the motor will render said semiconductor switching device conductive by supplying said control electrode of said semiconductor switching device to energize said switching winding of the motor to start the motor, whereas after the motor runs at nominal speed, the current through said main winding will decrease, causing a decrease of the current induced in said sensing means supplying said control electrode because of the reduction of the magnetic flux induced in said magnetic cores of said two adjacent poles of said main winding of the motor; then the conduction through said semiconductor switching device will stop and thus disconnect the starting winding of the motor.

4,388,581

DYNAMOELECTRIC MACHINE

Har S. Bhatnagar, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed May 18, 1981, Ser. No. 264,821
Int. Cl.³ H02P 1/44
U.S. Cl. 318—789 **13 Claims**



1. A dynamoelectric machine adapted for energization at a predetermined low speed in a single phase mode and for energization at a predetermined high speed generally in a two phase mode across a single phase power source in response to selective manual operation of a line switch adapted for connection in circuit relation between the dynamoelectric machine and the power source, the dynamoelectric machine comprising:

a housing including a pair of opposite end plates;

a terminal board supported on said housing at least generally adjacent one of said end plates and including a pair of terminal means adapted for respective connection with the power source;

a ferromagnetic stator arranged with said housing between said end plates and spaced from said terminal board, said stator including a bore, and a plurality of winding receiving slots;

a winding circuit disposed in at least some of said slots of said stator and including auxiliary winding means having a first winding section and a second winding section with one side of each of said first and second sections connected together in series circuit relation, a low speed main winding means, a high speed main winding means, the other side of said first winding section and one side of each of said low speed main winding means and said high speed main winding means being connected with one of said terminal means, the other side of each of said high speed main winding means and said second winding section being connected with each other at a circuit junction, and a capacitor connected between said circuit junction and the other side of said second winding section wherein said high speed run winding means, said first and second sections of said auxiliary winding means and said capacitor defines a permanently interconnected parallel winding circuit combination;

a rotatable shaft extending through said bore of said stator and rotatably journaled in said opposite end plates;

a rotor on said shaft conjointly rotatable therewith and

disposed at least in part within said bore of said stator so as to be arranged in magnetic coupling relation therewith upon the energization of the dynamoelectric machine;

a relay disposed at least in part within said housing and including first and second contacts, said first contact being connected with said parallel winding circuit combination at said circuit junction, coil means connected between said second contact and said one terminal means of said terminal board and adapted for excitation upon the energization of the dynamoelectric machine across the power source, a first switch member urged toward making engagement with said first contact and associated in magnetic coupling relation with said coil means, said first switch member being movable to break from said first contact and make with said second contact upon the excitation of said coil means;

a centrifugal switch actuating mechanism supported on at least one of said rotor and said shaft so as to be conjointly rotatable therewith and having a push collar disposed about said shaft, said centrifugal switch actuating mechanism being operable generally in response to rotation of said rotor upon the enegization of the dynamoelectric machine to move said push collar between an at-rest position and an axially displaced position thereof with respect to said shaft; and

switch means for at least in part controlling said winding circuit and supported on said terminal board, said switch means including third, fourth, and fifth contacts, said third contact being connected with said circuit junction, said fourth contact being connected with said first and second winding sections of said auxiliary winding means between the one sides thereof, respectively, said fifth contact being connected with the other side of said low speed main winding means, a second switch member arranged generally in driven relation with said push collar of said centrifugal switch actuating mechanism and urged toward making engagement with both of said third and fourth contacts when said push collar is in its at-rest position, and said second switch member being connected in circuit relation with said second contact of said relay, said first switch member being magnetically attracted from said first contact into making engagement with said second contact in response to the excitation of said coil means of said relay when the line switch is manually operated to initially effect starting excitation of only said high speed main winding means and said second winding section of said auxiliary winding means in said parallel winding circuit combination when said push collar is in its at-rest position with said second switch member in making engagement with both of said third and fourth contacts so as to effect split-phase starting energization of the dynamoelectric machine, said push collar being movable from its at-rest position to its axially displaced position in response to the operation of said centrifugal switch operating mechanism generally as said rotor attains the preselected low speed in response to the split-phase starting energization of the dynamoelectric machine with the movement of said push collar driving said second switch member from both said third and fourth contacts terminating the split-phase starting energization of the dynamoelectric machine and into making engagement with said fifth contact exciting said low speed main winding means so as to effect the single phase energization at the predetermined low speed of the dynamoelectric machine across the power source, said first switch member thereafter returning from said second contact to remake with said first contact in response to the deexcitation of said coil means of said relay in the event of the manual operation of the line switch to effect a preselected momentary deenergization of the dynamoelectric machine across the power source reducing the rotational speed of said rotor and said centrifugal switch operating mechanism below the predetermined low speed so as to effect return movement of said push collar from its displaced position toward its at-rest position and the disengagement of said second switch member from said fifth contact to deexcite said low speed main winding means, and said parallel winding circuit combination being subsequently excited when the line switch is again manually operated to reconnect the dynamoelectric machine across the power source and effect the reenergization of the dynamoelectric machine generally in the two phase mode thereof at the predetermined high speed.

4,388,582

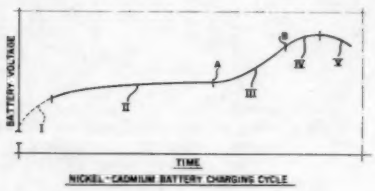
APPARATUS AND METHOD FOR CHARGING BATTERIES

David A. Saar, Timonium; Richard T. Walter, Baltimore, and John L. Bowman, Jr., Towson, all of Md., assignors to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 911,268, May 31, 1978, abandoned. This application Jan. 5, 1982, Ser. No. 337,296

Int. Cl.³ H02J 7/04; H03K 5/00

U.S. Cl. 320—20 **24 Claims**



NICKEL-CADMIUM BATTERY CHARGING CYCLE

1. A method of rapidly and efficiently charging a battery of the type in which the voltage characteristic thereof varies with the state of charge of the battery and in which the voltage characteristic varies with time during charging to exhibit an inflection point prior to the battery attaining substantial full charge, the inflection point characterized by a change in the slope of the voltage characteristic from successive increases in slope to a decrease, the method comprising the steps of:

supplying electrical energy to the battery for charging thereof;

monitoring said voltage characteristic of the battery periodically during charging;

computing the slope of the variation of said monitored voltage characteristic with time;

storing the maximum value of the so-computed slope values;

comparing each successively computed slope value with said stored maximum value;

identifying the inflection point exhibited in the variation of said voltage characteristic prior to the battery attaining substantial full charge by identifying a change in the so-compared slope values from successive increases in slope to a decrease; and

controlling the supply of electrical energy to the battery on the basis of the so-determined occurrence.

4,388,583

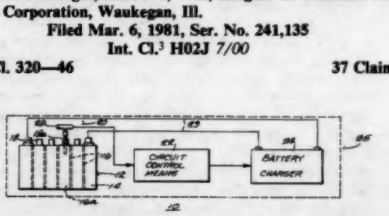
BATTERY CHARGER WITH TRANSDUCER FOR CONTROLLING CHARGE RATE

William R. Krueger, Hartford, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 6, 1981, Ser. No. 241,135

Int. Cl.³ H02J 7/00

U.S. Cl. 320—46 **37 Claims**



1. An apparatus for charging a battery including a case

containing at least one cell formed of a pair of electrodes immersed in an electrolyte, said apparatus comprising sound transducer means associated with the battery for providing a variable signal output in response to sound generated within the battery case, circuit control means coupled to said signal output for providing a variable control output in response to said signal output, and charging means connected to the battery electrodes and operable for charging the battery at a rate subject to said variable control output.

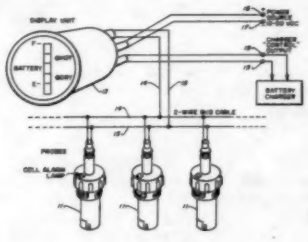
21. An apparatus for charging a battery including a case containing at least one cell formed of a pair of electrodes immersed in an electrolyte, said apparatus comprising fluid vibration transducer means associated with the battery for providing a variable signal output in response to fluid vibration in the battery electrolyte, circuit control means coupled to said signal output for providing a variable control output in response to said signal output, and charging means connected to the battery electrodes and coupled to said control output for supplying charging current to the battery subject to said control output.

4,388,584

BATTERY MONITORING AND CHARGER CONTROL SYSTEM

Ernest A. Dahl, 3247 Breaker Dr., Ventura, Calif. 93003, and George H. Barry, 21225 Saratoga Hills Rd., Saratoga, Calif. 95070

Filed Oct. 23, 1981, Ser. No. 314,319
Int. Cl.³ H02J 7/04
U.S. Cl. 320—48 **6 Claims**



1. A battery cell controlled automatic battery charging system which allows faster charging while simultaneously restricting overcharging to reduce cell damage, comprising:

a. a battery charging means operable to charge a bank of batteries;

b. a plurality of battery cell probes equal in number to the number of cells in the bank of batteries, one cell probe being provided for each battery cell, respectively;

c. a display means including electrical circuitry connected to said battery charging means;

d. each said battery cell probe being connected to said display means; and, each said battery cell probe being operable to sense and monitor the condition of its respective battery cell and indicate by electrical signals to said display means whenever a cell is out of specification by being any of low in charge, overheated, and low in electrolyte;

e. a cell alarm means provided on each said battery cell probe to indicate to an operator each of said battery cells that is out of specification;

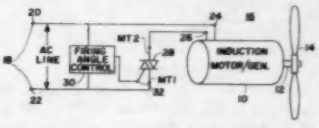
f. said display means and electrical circuitry being operable to visually display the condition of the most out of specification battery cell in the bank of batteries and also to provide a control signal to said battery charging means to cause said battery charging means to charge said bank of batteries whenever one of said probes indicates that a cell has a low charge; said display means and electrical circuitry operable to cause said battery charging means to stop charging whenever a battery cell becomes overheated or low in electrolyte, whereby faster charging is allowed with reduced possibility of over charging and cell damage.

4,388,585

ELECTRICAL POWER GENERATING SYSTEM

Frank J. Nola, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 16, 1981, Ser. No. 243,683
Int. Cl.³ H02P 9/00
U.S. Cl. 322—47 **1 Claim**



1. An electrical generating system comprising:

an induction motor/generator device having a power shaft and a pair of power terminals;

rotary power means for coupling a rotating movement to said power shaft;

an alternating current power supply line having a pair of power terminals;

triac means, including at least one triac, having a control input and a pair of power terminals;

said power terminals of said device and power line being interconnected through said power terminals of said triac, and

control means connected between one of said power terminals and said control input of said triac for delaying the turn "on" point of said triac with respect to the period of each half cycle of alternating current power to normally limit the power transfer from said power line to said device;

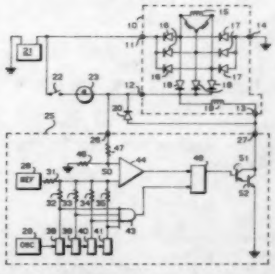
whereby a higher net transfer of power from said device to said power line may be obtained.

4,388,586

FIXED FREQUENCY VOLTAGE REGULATOR

Mihaly Lamoth, Coppet, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 17, 1981, Ser. No. 331,870
Int. Cl.³ G05F 1/56
U.S. Cl. 323—283 **3 Claims**



1. A fixed frequency voltage regulator useable in an automotive battery charging system, comprising: a temperature stable voltage reference providing an output; an oscillator providing an output; a digitally switched attenuator coupled to the output of the oscillator and providing an output which is combined with the output of the voltage reference; a first compara-

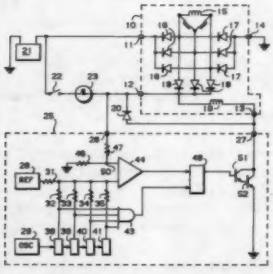
tor having a first and a second input and providing an output, the first input receiving the combined output from the attenuator and the voltage reference; a first flip-flop coupled to the output of the first comparator and providing an output; current switching means coupled to the output of the first flip-flop for controlling the current switching means; current sensing means coupled in series with the current switching means for sensing current in the current switching means; a second comparator having a first input coupled to the current sensing means and providing an output, a second flip-flop coupled to the output of the second comparator and providing an output; and a second logic gate having a first input coupled to the output of the first flip-flop and having a second input coupled to the output of the second flip-flop, the second logic gate providing an output for controlling the current switching means.

4,388,587

FIXED FREQUENCY VOLTAGE REGULATOR

Mihaly Lamoth, Coppet, and Heinz Lehning, Nyon, both of Switzerland, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 17, 1981, Ser. No. 331,869
Int. Cl.³ G05F *1/56*
U.S. Cl. 323—283 **5 Claims**



1. A fixed frequency voltage regulator useable in an automotive battery charging system, comprising: a temperature stable voltage reference providing an output; an oscillator providing an output; a digitally switched attenuator coupled to the output of the oscillator and providing an output which is combined with the output of the voltage reference; a comparator having a first and a second input and providing an output, the first input receiving the combined output from the attenuator and the voltage reference; a first flip-flop coupled to the output of the comparator and providing an output; and current switching means coupled to the output of the first flip-flop for controlling the current switching means.

4,388,588

FLUSH MOUNTABLE PLASMA DENSITY PROFILE PROBE DEVICE

Leonard S. Taylor, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 9, 1981, Ser. No. 242,086
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—72.5 **3 Claims**

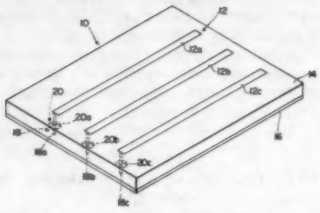
1. A plasma density profile probe device configured to be flush mountable to a surface of a test model and arranged conformally with the geometric shape thereof for measuring information about the density profile of an adjacent plasma flow field, comprising:

a dielectric support member;

a plurality of striplines, numbering at least three, embedded in one side of said dielectric support member;

a conducting ground plane affixed contiguously to the other side of said dielectric support member, said conducting ground plane having a plurality of mating conducting ground plane irises configured therein, each of said plurality of mating conducting ground plane irises being disposed subjacent to each of said plurality of striplines, and said conducting ground plane further including a plurality of line conductors each passing through corresponding ones of said plurality of mating conducting ground plane irises and being affixed to corresponding ones of said plurality of striplines for providing electrical connections thereto;

a voltage generator operatively connected via one of said



plurality of line conductors to a corresponding outer one of said plurality of striplines for driving it with a fixed voltage potential sufficient to induce fringing field lines of an electric field into the adjacent plasma flow field out above said conducting ground plane; and

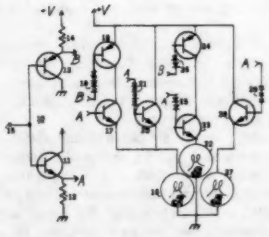
a plurality of amplifiers each being operatively connected via the other ones of said plurality of line conductors to corresponding other ones of said plurality of striplines for amplifying the current change in the fringing electric field lines as they are being influenced by the adjacent plasma flow field at each of said other ones of said plurality of striplines.

4,388,589

COLOR-EMITTING DC LEVEL INDICATOR

Bernhard P. Molldrem, Jr., 201 W. 77th St., New York, N.Y. 10024

Filed Jun. 23, 1980, Ser. No. 161,673
Int. Cl.³ G01R *19/00*
U.S. Cl. 324—96 **13 Claims**



1. A DC level indicator wherein a sensed DC level of a particular polarity and within a particular range is indicated by the apparent color of light comprising

DC input means receiving said DC level within said particular range and having said particular polarity, said range having a plurality of subranges each smaller than said range;

color light generating means formed of a plurality of light emitting means, each radiating light of a respective primary color, and positioned together so that when more than one of said light emitting means emits light the result-

ing emitted light appears as a blend of the respective colors; and

drive means connected to said DC input means for supplying current to each of said light emitting means that varies in response to the received DC level so that each said light emitting means radiates its respective color light when said DC level is within a respective subrange, but substantially ceases to radiate when said DC level is outside said respective subrange but within said predetermined range and so that within an overlapping portion of said subranges two of said light emitting means emit their respective color light, said drive means being powered by voltage of said particular polarity.

4,388,590

DIGITAL AUDIO LEVEL METERING

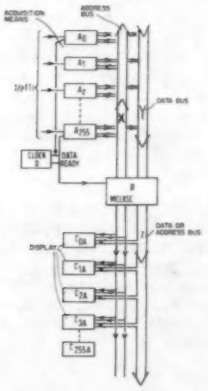
John W. Richards, Chalfont St. Peter, and Ian Craven, Fulham, both of England, assignors to EMI Limited, Hayes, England

Filed Jul. 3, 1980, Ser. No. 165,762

Claims priority, application United Kingdom, Jul. 7, 1979, 7923799

Int. Cl.³ G01R *19/16*

U.S. Cl. 324—103 P **9 Claims**



1. An arrangement for displaying a visual indication of the amplitude level of digital audio signals comprising,

acquisition means for receiving digital audio signals and for generating therefrom further digital signals representitive of a characteristic of the amplitude of the digital audio signals received,

control means for performing periodic interrogations of the output of the acquisition means and for transmitting said further signals to a display location,

and display means comprising an input means, disposed at said display location, for receiving said transmitted further signals, means for providing a visual indication of the amplitude value level represented by said further signals, and means for causing said indicated value to decay at a predetermined rate if greater than the amplitude level represented by a signal subsequently transmitted to the input means, and to be substituted thereby if less.

4,388,591

SELF-SEALING TEST PROBE

Patrick E. Lannan, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 22, 1980, Ser. No. 219,120

Int. Cl.³ G01R *31/22*

U.S. Cl. 324—158 P **6 Claims**

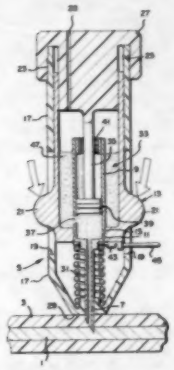
1. A test probe of the type for penetrating insulation of an insulated electrical conductor to test the condition of the conductor core and for sealing the hole made in the insulation after the test has been completed, comprising:

housing means having reservoir means containing sealant means;

test probe means secured to said housing means, said test probe means including barrel means and hollow needle probe means, said barrel means having an aperture enabling said sealant means to enter said barrel means;

electrical conductor means connected to said test probe means;

mounting means in which said housing means is mounted to enable said housing means to move relative to said mounting means from a non-testing position to a testing position;



means sealing said aperture when said housing means is in said non-testing position;

means on said housing means for operating said housing means so that said housing means is moved relative to said mounting means from said non-testing position to said testing position thereby causing said hollow needle probe means to penetrate the insulation and make electrical contact with the electrical conductor core to test the condition thereof whereafter said housing means is moved back to said non-testing position causing said sealing means to express said sealant means from said barrel means along said hollow needle probe means into the hole formed in the insulation by the hollow needle probe means thereby sealing such hole.

4,388,592

MULTIAXIS MAGNETOMETER APPARATUS WITH ORTHOGONALLY DISPOSED RECTANGULAR HOUSINGS FOR MOUNTING SEPARATE SENSOR ASSEMBLIES

Erick O. Schonstedt, Reston, Va., assignor to Schonstedt Instrument Company, Reston, Va.

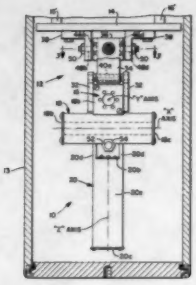
Filed Jun. 24, 1980, Ser. No. 162,488

Int. Cl.³ G01R *33/02, 33/04*

U.S. Cl. 324—247 **16 Claims**

1. A structure for mounting a plurality of separate magnetic sensor assemblies in a multi-axis magnetometer and the like, comprising a plurality of non-magnetic elongated housings of rectangular cross section, means mounting a separate sensor assembly in each of said housings with the sensitive axis of the assembly substantially aligned with the longitudinal axis of the housing, connecting means connecting said housings together into a discrete unit with the longitudinal axes of the housings

disposed in mutually orthogonal planes and with elongated planar surfaces of the respective housings in surface-to-surface



contact, and support means independent of said connecting means for supporting said unit in an outer casing and the like.

4,388,593

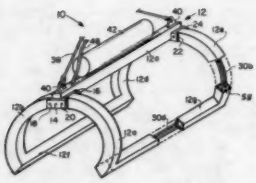
COIL DEVICE FOR UNDERWATER MAGNETIC TESTING

John Mittleman, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 13, 1980, Ser. No. 206,424

Int. Cl.³ G01R *33/12*; G01N *27/84*; H01F *5/04*

U.S. Cl. 324—262 **6 Claims**



1. A magnetic coil device for use under water in magnetic particle inspection of structural members, said device includng an electrical winding and characterized by the improvement wherein said winding comprises:

first and second substantially annular, coaxially spaced electrically conductive solenoid coils each having a predetermined diameter and each characterized by a radial discontinuity aligned with the discontinuity of the other;

first and second axially extending conductor means connecting conductor portions of one of said coils in alternate sequence with conductor portions of the other coil for simultaneous series energization whereby substantially annular current flow occurs in one direction at any instant in all said conductor portions of one of said coils and occurs in the opposite direction in all said conductor portions in the other of said coils;

said coils being flexible, at least in part, whereby said coils can be spread open and closed at said discontinuities to permit placement around an elongate structural member;

conductor lead means for energizing said winding from a remote electrical power source; and

support means for maintaining said coils coaxially spaced and supporting said winding relative to a structural member being inspected.

4,388,594

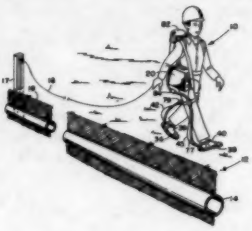
SEMI-PERMEABLE ELECTROLYTIC CELL AND METHOD FOR SURVEYING BURIED STRUCTURES

Robert L. Deskins, Huntington Beach; Gary L. Matlack, Ontario, and Robert D. Ashbaugh, Mission Viejo, all of Calif., assignors to Harco Corporation, Medina, Ohio

Filed Jun. 9, 1980, Ser. No. 157,678

Int. Cl.³ G01V *3/15*; G01R *31/02*; G01N *27/00*

U.S. Cl. 324—348 **36 Claims**



1. A process of performing electrical surveys of buried structures comprising the steps of connecting a wire with respect to the buried structure, and then walking on the surface over the structure on an electrically conductive liquid cell while the wire is paid out along the structure, said cell being in the form of footwear for at least one foot of the surveyor and connected to such wire through a meter for measuring pipe to soil type potential difference to obtain such survey.

4,388,595

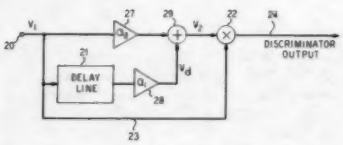
APPARATUS AND METHOD FOR REMOVING BIAS DISTORTION FROM A PRODUCT DEMODULATOR

Grant P. Brooks, Randolph, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 26, 1981, Ser. No. 247,800

Int. Cl.³ H03D *3/06*; H03K *9/00*; H04L *27/14*

U.S. Cl. 329—104 **10 Claims**



1. Apparatus for correlating an input signal with a time delayed version of itself including means for additively combining a portion of the input signal with said delayed version to form a delay compensated signal; and

means for multiplying said delay compensated signal with the input signal to generate an output signal.

4,388,596

FREQUENCY CONTROLLED SIGNAL GENERATING CIRCUIT

Noriyuki Yamashita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 28, 1980, Ser. No. 211,112

Claims priority, application Japan, Nov. 29, 1979, 54-154661; Jun. 30, 1980, 55-89426

Int. Cl.³ H03L *7/10*

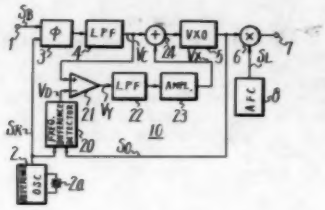
U.S. Cl. 331—1 A **17 Claims**

1. A circuit arrangement for generating a frequency controlled signal which has its phase made synchronous with an input signal, comprising:

a variable frequency oscillator for generating the frequency controlled signal;

means for providing a reference signal;

a phase control circuit including a phase comparator for generating, as its output, a control signal based on the phase relation of said input and reference signals, said control signal being supplied to said variable frequency oscillator to control the phase of said frequency controlled signal;



means for detecting a frequency difference between said frequency controlled and reference signals and providing a corresponding output; and

means for comparing the outputs of the phase comparator and the frequency difference detecting means to produce an additional control signal which is mixed with the first mentioned control signal for further controlling said variable frequency oscillator.

4,388,597

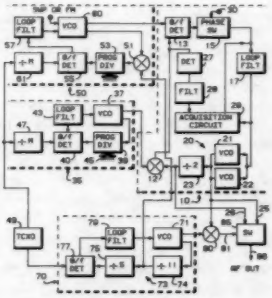
FREQUENCY SYNTHESIZER HAVING PLURAL PHASE LOCKED LOOPS

Robert H. Bickley, Scottsdale, and Albert H. Hunt, Tempe, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 156,221, Jun. 3, 1980, abandoned. This application Jun. 14, 1982, Ser. No. 388,392

Int. Cl.³ H03L *7/18, 7/22*

U.S. Cl. 331—2 **10 Claims**



10. A frequency synthesizer controllable to produce any of a plurality of steps of frequency withing a band of frequencies in response to control signals thereto, said synthesizer comprising:

a plurality of phase locked loops, connected to provide output frequencies in incremental steps, a first one of said loops including a programmable divider programmable in predetermined division steps in response to a control signal applied thereto, and

a second one of said loops including a programmable divider programmable in predetermined division steps, different than the steps of said programmable divider of said first loop, in response to a control signal applied thereto, one of said first and second loops providing a programmable reference frequency output in one of a normal frequency range and an additional frequency range extending substantially beyond said normal range; and

said programmable divider of said first loop and said programmable divider of said second loop being preprogrammed to reject predetermined combinations of a first loop output frequency having a fundamental frequency and a second loop output frequency having a harmonic coinciding with said fundamental of said first loop output frequency, said programmable dividers being preprogrammed to replace each said rejected combination with a different combination, and said additional frequency range of said second loop providing an allowable combination corresponding in output frequency to every rejected combination.

4,388,598

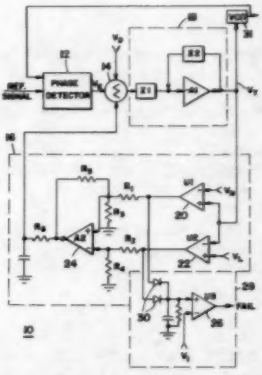
LOSS-OF-PHASE-LOCK INDICATOR CIRCUIT

William F. Egan, Cupertino, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 3, 1980, Ser. No. 203,086

Int. Cl.³ H03L *7/12*

U.S. Cl. 331—4 **2 Claims**



1. A loss-of-phase-lock indicator circuit comprising:

(a) a phase detector receiving as inputs a reference signal and an output signal from a voltage controlled oscillator (VCO), said phase detector producing as output an error signal when said signal from said VCO and said reference signal vary a predetermined amount;

(b) a summing circuit receiving as inputs a predetermined dither voltage signal, a sweep-feedback signal and said error signal from said phase detector and having an output signal;

(c) a feedback circuit receiving said output signal from said summing circuit and having as output a tuning voltage signal, said tuning voltage signal being received as a control input by said VCO;

(d) a first comparator receiving as inputs said tuning voltage signal and a voltage corresponding to an upper limit value for said tuning voltage and having an output;

(e) a second comparator receiving as inputs said tuning voltage signal and a voltage corresponding to a lower limit value for said tuning voltage signal and having an output;

(f) an operational amplifier serially connected to and receiving said outputs of said first and said second comparator and having as output said sweep feedback signal received by said summing circuit such that said tuning voltage

signal sweeps between said upper and said lower limit values when said VCO is out-of-lock; and

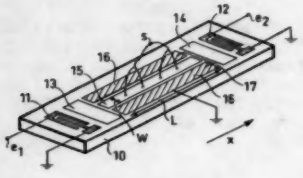
(g) means for generating a failure signal for all out-of-lock conditions operably connected to said first and said second comparators.

4,388,599

PIEZOELECTRIC ELASTIC-WAVE CONVOLVER DEVICE

Herve Gautier, and Charles Maerfeld, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 18, 1981, Ser. No. 264,691
Claims priority, application France, May 20, 1980, 80 11225
Int. Cl.³ H01L 41/08; H03H 9/30
U.S. Cl. 333—150 **40 Claims**



1. A convolver device based on the propagation of acoustic waves at the surface of a piezoelectric solid and comprising:

a piezoelectric substrate,

means for exciting two backward-traveling acoustic waves at the frequency f,

means consisting of at least two electrodes for collecting the signal at the frequency 2f, said signal being produced as a result of the nonlinear interaction of the two acoustic waves,

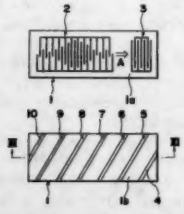
wherein the output of said device is connected to one of said electrodes by means of a plurality of electrical contacts placed lengthwise along the axis of propagation of the two acoustic waves.

4,388,600

SURFACE ACOUSTIC WAVE DEVICE

Kikuo Wakino, Muko; Michio Kadota, Kyoto, and Tomoharu Sato, Takatsuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 18, 1981, Ser. No. 245,065
Claims priority, application Japan, Mar. 22, 1980, 55-36688
Int. Cl.³ H03H 9/145, 9/42
U.S. Cl. 333—151 **15 Claims**



1. A surface acoustic wave device comprising:

a substrate having first and second oppositely facing flat surfaces, said substrate being made of a material capable of propagating acoustic waves along said first flat surface;

a first transducer for launching acoustic waves and a second transducer for receiving acoustic waves launched by said first transducer, said first and second transducers being deposited on said first flat surface;

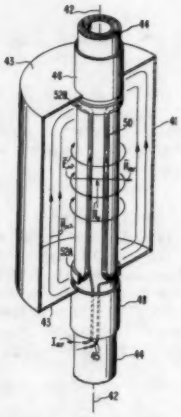
said substrate being formed with a plurality of elongated grooves in said second flat surface in an angled relation with the direction of propagation of said acoustic waves and with groove length greatly exceeding groove depth, said grooves being divided into at least two groups in which the depth of the grooves in the first group is different from that in the second group.

4,388,601

SYMMETRIZING MEANS FOR RF COILS IN A MICROWAVE CAVITY

Robert C. Sneed, Jr., Campbell; Robert G. MacNaughton, Cupertino, and James H. Jacobsen, Palo Alto, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 30, 1981, Ser. No. 307,144
Int. Cl.³ H01P 7/06, 5/00
U.S. Cl. 333—227 **10 Claims**



1. A microwave resonant cavity for sustaining a desired distribution of microwave vector magnetic and electric field and an RF coil structure disposed within said cavity, said coil comprising first portions orthogonal to the direction of said microwave magnetic field and second portions substantially conformal with the direction of said microwave magnetic field and electrically conducting symmetrizing means disposed about said second portions of said RF coil, said symmetrizing means substantially conformal with said microwave electric field direction in the neighborhood of said second portions.

4,388,602

ELECTRON BEAM INFLUENCING APPARATUS INCORPORATING VERTICAL BEAM MOVEMENT FUNCTION

Dennis L. Dodds, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 18, 1981, Ser. No. 303,476
Int. Cl.³ H01F 1/00
U.S. Cl. 335—212 **4 Claims**

1. In a television display system incorporating a kinescope having a display screen and an electron gun assembly disposed within a neck of said kinescope for producing three electron beams aligned along a horizontal axis plane, means for effecting movement of said beams comprising:

a strip of magnetizable material, disposed adjacent said kinescope neck and encircling said beams, said strip incorporating a first set of magnetized zones for producing substantially only purity correction of said beams, and incor-

porating a second set of magnetized zones for producing substantially only vertical position adjustment of said

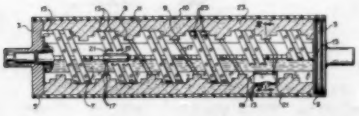
beams on said display screen, said first and second sets of magnetized zones being located in a common longitudinal plane through said kinescope neck.

4,388,603

CURRENT LIMITING FUSE

Stephen P. Hassler, Muskego, and Theodore O. Sokoly, Mayville, both of Wis., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed May 15, 1981, Ser. No. 263,877
Int. Cl.³ H01H *85/04*
U.S. Cl. 337—158 **10 Claims**



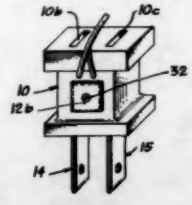
1. A current limiting fuse comprising a main fusible element of a predetermined length, element interrupting means for interrupting the flow of current through said main fusible element in response to a prolonged over-current condition in said main fusible element, said element interrupting means being located at a predetermined point along said main fusible element, an auxiliary fusible element having first and second ends and non-linear resistor means having a predetermined voltage break down level, each end of said auxiliary fusible element being connected electrically to said main fusible element at points therealong on opposite sides of said element interrupting means, at least one of said first and second ends of said auxiliary fusible element being connected electrically to said main fusible element through said non-linear resistor means.

4,388,604

FUSED PLUG ASSEMBLY WITH PUSH-IN FUSE UNIT

Joseph M. Ahroni, P.O. Box 3907, Seattle, Wash. 98124

Continuation of Ser. No. 101,497, Dec. 10, 1979. This application May 1, 1981, Ser. No. 259,516
Int. Cl.³ H01H *85/02*
U.S. Cl. 337—197 **5 Claims**



1. A fused plug assembly comprising:

a plug body formed with a central fuse socket;

a pair of coplanar, spaced prong members projecting as prongs from one end of the plug body, said prong members each being exposed by a contact portion to the fuse socket;

a pair of wire leads extending from the plug body and having a pair of spaced wire contacts exposed to said fuse socket in general alignment with and spaced from respective of said contact portions;

a push-in fuse means having a fuse body slidably received in the fuse socket in a direction perpendicular to the plane of the prong members and having a central hole therethrough extending in said direction, said fuse means having an active pair of spaced fuse elements mounted directly on said fuse body and each arranged to engage a said contact portion and respective wire contact, said fuse body also having a spare pair of fuse elements mounted directly thereon and arranged to become active responsive to removal of the fuse means from the fuse socket, changing the orientation of the fuse means relative to the socket to a reoriented position in which said central hole also extends in said direction and said spare fuse elements occupy the position previously occupied by said active fuse elements, and then reinserting the reoriented fuse unit; and

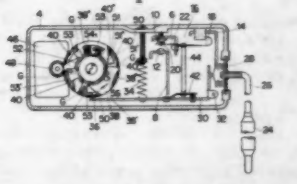
a removable threaded locking device passing through said central hole into said plug body for holding the fuse means in said socket.

4,388,605

DEFROST THERMOSTAT USED IN A REVERSIBLE REFRIGERATING CYCLE FOR HEAT PUMPS

Shigeki Machida, and Takeo Makita, both of Tokorozawa, Japan, assignors to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, Japan

Filed Oct. 19, 1981, Ser. No. 312,893
Int. Cl.³ H01H *37/62*
U.S. Cl. 337—301 **9 Claims**



1. A defrost thermostat used in a reversible refrigerating cycle for heat pumps comprising

a snap-action toggle switch mechanism having a movable contact plate normally urged toward a selected one of two positions;

an actuator means for actuating said movable contact plate;

thermally responsive means to move said actuating means; and

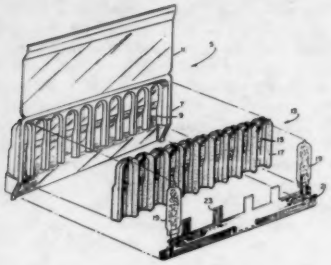
a timer driven cam arrangement to move said actuating means, said timer driven cam arrangement including a disc cam having recesses at predetermined intervals in a periphery thereof, a first masking member provided coaxially with said disc cam and having a corresponding number of masking portions to mask said recesses in the disc periphery, each masking portion being adapted to define an unmasked gap in the recess.

4,388,606

SEQUENTIAL PHOTOFLASH ARRAY AND FABRICATION EMPLOYING RADIATION-ACTIVATED SWITCHES

John W. Shaffer, and Boyd G. Brower, both of Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 13, 1981, Ser. No. 253,328
Int. Cl.³ H01L *31/08*
U.S. Cl. 338—15 **16 Claims**



1. A radiation-activated switch for a self-sequencing multi-lamp photoflash array comprising a pair of electrical conductors spaced by a chemical switch paste and characterized by the improvement wherein said chemical switch paste includes a heat sensitive silver compound, a powdered metal in stoichiometric excess and selected from the group consisting of aluminum and titanium and an organic binder with said chemical switch paste responsive to radiation from a nearby photoflash lamp activated from a low voltage source to provide a low resistance to electrical current flow between said pair of electrical conductors.

4,388,607

CONDUCTIVE POLYMER COMPOSITIONS, AND TO DEVICES COMPRISING SUCH COMPOSITIONS

Lester T. Toy, San Francisco; Wendell W. Moyer; Bernard J. Lyons, both of Atherton, and David A. Horsma, Palo Alto, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 909,971, May 26, 1978, abandoned, which is a continuation of Ser. No. 751,095, Dec. 16, 1976, abandoned, and a continuation of Ser. No. 909,970, May 26, 1978. This application Oct. 17, 1979, Ser. No. 85,679
Int. Cl.³ H01B *1/04;* H01C *7/13*
U.S. Cl. 338—22 SD **49 Claims**

1. An electrical device comprising an element composed of a conductive polymer and at least two electrodes adapted to be connected to an external source of electrical power so as to cause an electrical current to pass through the element, said element being composed of a cross-linked conductive polymer composition which exhibits PTC behavior with an R_{14} value of at least 2.5 and which comprises

(a) conductive carbon black having a particle size greater than 18 millimicrons, a d-spacing greater than 360, and a surface area (A) which is less than

$$1.2S+e^{S/50}$$

where S is the DBP absorption of the carbon black, said carbon black being present in amount at least 15% by weight of the composition and being dispersed in

(b) at least one crystalline copolymer which consists essentially of units derived from at least one olefin and at least 10 weight %, based on the copolymer, of units derived from at least one olefinically unsaturated comonomer containing a polar group;

subject to the proviso that when

(i) said crystalline copolymer (b) has a melt index of more than 20 and

(ii) $2L+5 \log_{10} R<45$

where L is the content of carbon black in percent by weight based on the weight of the composition and R is the resistivity of the composition at 25° C. in ohm.cm.,

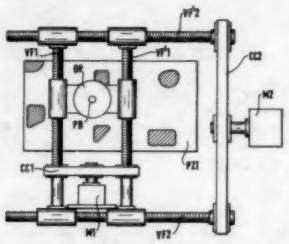
said composition has a gel fraction of at least 0.6.

4,388,608

VEHICLE LOCATION MONITORING SYSTEM

Patrice Bernard, 7, rue Fortuny, 75017 Paris, France

Filed Mar. 6, 1981, Ser. No. 241,299
Claims priority, application France, Mar. 6, 1980, 80 05027
Int. Cl.³ G08G *1/00, 1/12*
U.S. Cl. 340—24 **13 Claims**



1. A system for monitoring the location of a vehicle, said system comprising on board said vehicle:

primary system means for providing an estimated location of the vehicle from an initial known location and heading and from measuring subsequent travel of the vehicle; and

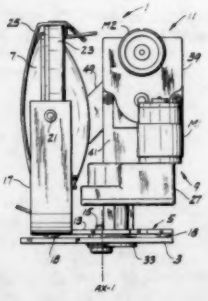
secondary system means for correcting the estimated location of the vehicle as given by the primary system including means for comparing the estimated location with stored locations of "forbidden" areas where the vehicle cannot possibly be.

4,388,609

SIGNAL LIGHT WITH PRECESSING OSCILLATION CONTROL

W. Kenneth Menke, Glendale, Mo., assignor to Public Safety Equipment Company, St. Louis, Mo.

Filed Aug. 31, 1981, Ser. No. 297,724
Int. Cl.³ B60Q *1/00*
U.S. Cl. 340—84 **27 Claims**



1. A signal light comprising a base, a lamp frame pivoted on the base on a first axis, a lamp pivoted on the lamp frame on a second axis extending generally perpendicular to said first axis,

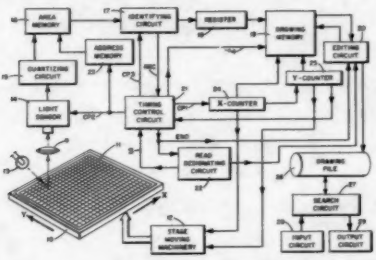
first drive means comprising a first electric motor for oscillating the lamp frame on said first axis generally at a first rate of oscillation, and second drive means comprising a second electric motor for oscillating the lamp on said second axis at a second rate of oscillation, the ratio of said first rate of oscillation to said second rate of oscillation being adapted to change during operation of the signal light due to drift in the output speed of one motor relative to the output speed of the other motor whereby on oscillation of the lamp frame and lamp about their respective axes the beam of light projected by the lamp is adapted to trace a changing pattern.

4,388,610

APPARATUS FOR READING DRAWINGS

Shou Tsunekawa, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 21, 1981, Ser. No. 226,645
Claims priority, application Japan, Jan. 28, 1980, 55-7771
Int. Cl.³ G06K 9/00
U.S. Cl. 382—8 **8 Claims**



1. A machine implemented method for reading symbols on a drawing wherein the drawing comprises a preprinted lattice pattern with orthogonal lines forming unit rectangular areas and each symbol or portion thereof is drawn within one or more of said unit areas, each symbol is drawn so that the portion of the symbol within a unit area has a predetermined size and position with respect to the sides of said unit area, said method comprising the steps of;

scanning several discrete points within each unit area and producing binary data for each scanned point;

storing standard pattern data;

comparing said binary data with said standard pattern data to identify the symbol or symbol portion with the scanned unit area and producing a code representing the symbol or symbol portion when identity is established;

detecting the position of the scanned unit area; and

storing the code at an address defined by said detecting step.

4,388,611

ELECTRICITY BILLING METER HAVING UNIQUE A/D CONVERSION SYSTEM

James E. Haferd, Columbus, Ohio, assignor to Scientific Columbus, Inc., Columbus, Ohio

Filed Apr. 21, 1981, Ser. No. 256,058
Int. Cl.³ H03K 13/02
U.S. Cl. 340—347 SH **7 Claims**

1. A method for converting a plurality of time varying, periodic power distribution system signals to digital data representing said signals, said method comprising:

(a) simultaneously sampling said time varying signals at a nominal group of spaced sampling positions and storing said samples to form constant signals;

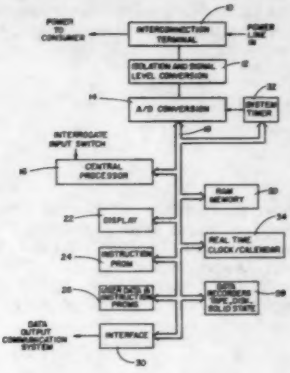
(b) sequentially incrementing a digital count;

(c) generating a ramp by converting said digital count to analog form;

(d) continuously comparing the amplitude of said ramp to the amplitude of each of said plurality of constant signals;

(e) detecting each intersection of the ramp amplitude with a constant signal amplitude;

(f) storing said digital count and a data signal representing the constant signal which was intersected in response to each detected intersection, wherein during each period of said ramp a plurality of counts are stored each of said counts providing a digital data byte representing the amplitude of each of said plurality of non-time-varying analog signals; and



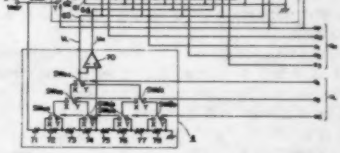
(g) repeating steps (a) through (f) to take a plurality of additional groups of said samples during subsequent representative, repetitive cycles but at angularly spaced positions in the composite cycle with respect to the nominal group of samples beginning at a selected angular position to form a plurality of groups of samples for a composite cycle and for each of said time varying analog samples.

4,388,612

SIGNAL CONVERTER

Katsuaki Takagi, Kokubunji, and Yuzo Kita, Fuchu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 28, 1981, Ser. No. 287,824
Claims priority, application Japan, Jul. 28, 1980, 55-102531
Int. Cl.³ H03K 13/02
U.S. Cl. 340—347 DA **26 Claims**



1. A digital-to-analog converter comprising m capacitors corresponding to m upper bits of a digital signal having n lower bits, said capacitors having binary-weighted capacitance ratios and whose ends on one side are connected in common to an analog voltage output line; a first potential line; a second potential supply line; a third potential supply line; a fourth potential supply line; a resistor string which is connected to a first potential at one end thereof and a second potential at the other end thereof and which divides the terminal voltage across both its ends by 2^n; divided-voltage deriving means

connected to said resistor string to sequentially derive first and second voltages equal to $i/2^n$ (where i denotes a numerical value expressed by the n bits of said digital signal) and $(2^n-i)/2^n$ of said terminal voltage, respectively, from said resistor string in accordance with the n lower bits of the digital signal and to deliver them to said third potential supply line and said fourth potential supply line, respectively; switching means for selectively connecting the ends of the respective capacitors on the other side thereof with said first, second, third and fourth potential supply lines; and means for controlling said switching means sequentially in accordance with the m upper bits of the digital signal and the voltage appearing on said analog voltage output line.

4,388,613

OPTICAL DISPLACEMENT TRANSDUCERS

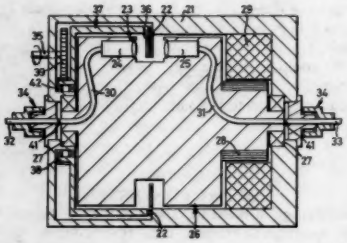
Derek A. Rush, London, and Roger D. Swadling, Cheltenham, both of England, assignors to Smiths Industries Public Limited Company, London, England

Filed Dec. 30, 1981, Ser. No. 335,977

Claims priority, application United Kingdom, Jan. 13, 1981, 8100961

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 P **8 Claims**



1. An optical displacement transducer for providing a digital output representative of the displacement of a variable from a datum value comprising,

(a) a light beam emitter and a light beam receiver disposed on a common optical axis,

(b) a stationary digital encoding element comprising an optical grating disposed between the light beam emitter and and receiver, the grating extending in a circular path with the grating lines extending substantially radially of said path,

(c) means for causing rotation of said light beam emitter and receiver together about the center of said circular path whereby the light beam as seen by said receiver is in the form of a series of light pulses,

(d) a first reference position encoded on said digital encoding element,

(e) a second reference position in the form of a light blocking mask adjacent and angularly displaced about the center of said circular path from said first reference position whereby a predetermined light pulse count is produced during said rotation of the light beam emitter and receiver through the angle between said first and second reference positions, and

(f) control means for adjusting said second reference position relatively to said first reference position in response to displacement of said variable whereby to vary said pulse count in response to said displacement

4,388,614

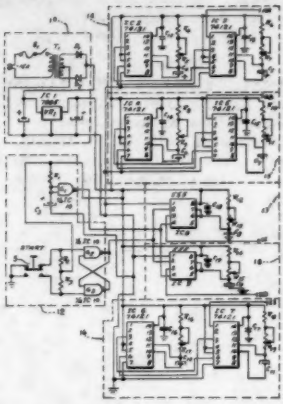
AUTOMATICALLY SEQUENCED SIGNALING SYSTEM

William A. Pezzillo, Mt. Pleasant, Pa., and Charles C. Crickmer, Huntington, W. Va., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 15, 1980, Ser. No. 216,103

Int. Cl.³ G08B *3/00*

U.S. Cl. 340—384 E **5 Claims**



1. An automatically sequenced signaling system comprising in combination:

a control means to initiate a signaling sequence, said control means providing a start signal:

a plurality of interval signal generators to generate interval signals, each of said plurality of interval signal generators being variable in time, each of said plurality of interval signal generators receiving said start signal, each of said plurality of interval generators generating a different interval signal;

first and second sequence timers to provide first and second sequence time signals;

a first gate means to receive said interval signals and said first sequence time signal, said first gate means providing a first output signal;

a second gate means to receive said interval signals and said second sequence time signal, said second gate means providing a second output signal;

a switching means to receive said first and second sequence time signals and said first and second output signals, said switching means having a plurality of switch positions to respectively receive the applied signals; and

an alarm driving means connected to said switching means to receive an alarm signal from one of said plurality of switch positions, said alarm signal activating a signaling device.

4,388,615

TESTING EMERGENCY BATTERY EQUIPMENT

Barry S. Ford, 21 Park Rd., Ducklington, Witney, Oxfordshire, and Sydney Birkett, Old School, Minster Lovell, Oxfordshire, both of England

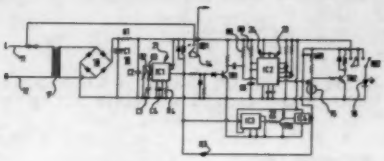
Filed Mar. 5, 1981, Ser. No. 240,989

Int. Cl.³ G08B *29/00, 21/00*

U.S. Cl. 340—516 **6 Claims**

1. Testing apparatus for testing stand-by battery powered lighting equipment which is adapted for energization in response to mains failure, the apparatus comprising an electrical circuit including a sensor means for sensing the visible light emitted by the stand-by equipment when activated, means for indicating when the light emitted is below a predetermined

value, a timing circuit for disconnecting the mains supply from the stand-by equipment automatically at regular intervals and a



power supply circuit connected to the timing circuit for energizing the sensor means when the timing circuit has disconnected the mains supply.

4,388,616

FIRE DETECTION SYSTEM WITH PROGRAMMED SENSITIVITY CHANGES

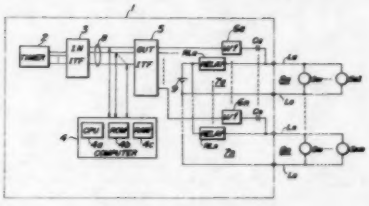
Haruchika Machida, Sagamihara, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,646

Claims priority, application Japan, Mar. 19, 1980, 55-35108

Int. Cl.³ G08B *17/06*

U.S. Cl. 340—587 **12 Claims**



1. A fire detection system, comprising:

at least one fire sensor having a changeable detection sensitivity for producing a fire detection signal and including sensitivity change control means for changing the detection sensitivity in response to any one of a plurality of predetermined detection sensitivity change commands;

a receiver including a timer for producing a clock signal corresponding to the time of day, command means for providing the predetermined detection sensitivity change commands in response to the clock signal, said change commands being programmed according to the time of day, a power source connected to said fire sensor for supplying a power source voltage to said fire sensor, and a receiving relay for receiving the fire detection signal;

at least one power/signal line for coupling said fire sensor to said receiver; and,

wherein said command means includes a computer having a read only memory for storing a detection sensitivity pattern programmed according to the time of day, said computer reading out from said read only memory, in response to said clock signal from said timer, present a detection sensitivity signal, converting means for converting said present detection sensitivity signal to a frequenc; signal, and at least one first capacitor inserted between said converting means and said at least one power/signal line, and said fire sensor further includes a low-pass filter and a second capacitor which are connected to said power/signal line, a smoke sensing portion and a fire judging section to both of which a power source voltage derived from said low-pass filter is applied and a switching element for producing said fire detection signal, said frequency signal being supplied through said second capacitor to said sensitivity change control means, and a sensitivity change control signal derived from said sensitivity change control means and an output signal from said smoke sensing portion are supplied to said fire judging section, so that the switching of said switching element is controlled by the output signal from said fire judging section.

4,388,617

FIRE ALARM DEVICE HAVING THERMAL SENSITIVITY ENHANCEMENT

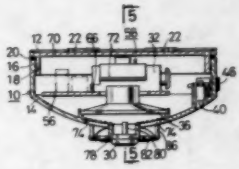
Yoshitaka Nakanishi, 12-9, Yawata 5-chome; Hiroshi Nakanishi, 16-18, Yawata 6-chome, both of Ichikawa-shi, Chiba-ken, and Takashi Nakanishi, c/o Suzue Yamakawa, 1-11, Kandaizumi-cho, Chiyoda-ku, Tokyo, all of Japan

Filed Jun. 29, 1981, Ser. No. 278,456

Claims priority, application Japan, Dec. 16, 1980, 55-176530

Int. Cl.³ G08B *17/06, 21/00*

U.S. Cl. 340—594 **18 Claims**



1. A fire alarm device, comprising:

a case comprising a main body portion to be mounted stationary and a removable body portion which can be removed from the main body portion, said removable body portion having openings on the front side thereof;

fire sensing means for sensing fire, said fire sensing means comprising a fire detecting element and a heat sensing plate, and said fire sensing means being mounted on said case in front of the openings of the removable body portion; and

alarm means including a loudspeaker for issuing an acoustic alarm from said loudspeaker in response to a detection signal from the fire sensing means, said loudspeaker having a conical diaphragm and said loudspeaker is mounted behind the openings of the removable body portion with said conical diaphragm facing the openings.

4,388,618

BATTERY STATE OF CHARGE INDICATOR OPERATING ON BIDIRECTIONAL INTEGRATIONS OF TERMINAL VOLTAGE

Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mt. Kisco, N.Y.

Filed Jan. 7, 1981, Ser. No. 223,041

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—636 **18 Claims**

1. A battery state of charge indicator comprising

means for measuring battery terminal voltage on a continuing basis during both positive and negative voltage excursions with relation to a summed reference value,

means including a fixed reference voltage source and a summing means for providing a summed reference value for comparison with said measurement,

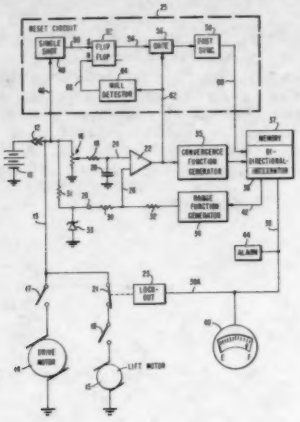
means for comparing said battery terminal voltage measurement with said summed reference value and for deriving a difference signal value,

means responsive to said difference signal value for generating convergence function signals which vary dependent on the magnitude and polarity of said difference signal value,

a bidirectional integrator connected to receive said convergence function signals and operable to integrate in one direction for positive convergence function signals and in the other direction for negative convergence function

signals to provide an integrated output signal as a measure of the state of charge,

said means for providing a summed reference value including feedback means connected from the output of said



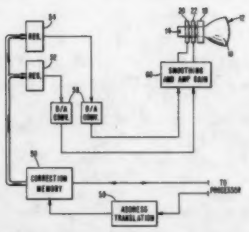
integrator to said summing means for summation of a predetermined function of the integrated output signal with the fixed reference voltage from said fixed reference voltage source to thereby modify said summed reference value.

4,388,619

CORRECTOR FOR BUNDLE DEFLECTION DISTORTION IN MULTIBEAM CATHODE RAY TUBES

Vernon D. Beck, Ridgefield, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 279,280
Int. Cl.³ G09G 1/20
U.S. Cl. 340—727 **8 Claims**



1. A display system including a multiple beam cathode ray display tube comprising an array of cathodes and beam forming means, for projecting a matrix array of electron beams onto the screen of said display tube,

deflection means for simultaneously deflecting said bundle of electron beams to form a scanning pattern,

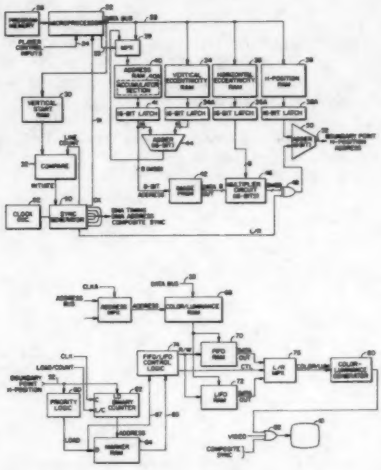
means external to said tube disposed in electromagnetically interactive relationship with said bundle of electron beams for simultaneously focusing each of said electron beams of said bundle of electron beams and for rotating said bundle of electron beams by an amount sufficient to counter undesired rotational distortion of said bundle, said means including a pair of coils, each coil comprising a single winding, wound to selectively provide opposing axial magnetic fields, and means connected to said coils for supplying corrective signals thereto comprising means for dynamically energizing said coils as a function of the instantaneous location of said projected matrix array on the screen of said display tube.

4,388,620

METHOD AND APPARATUS FOR GENERATING ELLIPTICAL IMAGES ON A RASTER-TYPE VIDEO DISPLAY

David L. Sherman, Sunnyvale, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Jan. 5, 1981, Ser. No. 222,480
Int. Cl.³ G06F 3/14
U.S. Cl. 340—744 **12 Claims**



1. Apparatus for forming a movable elliptical image on a video display screen of the type having a scanning electron beam forming a plurality of horizontal scan lines in response to timing signals including vertical and horizontal retrace intervals, said image being variable in eccentricity, the apparatus comprising:

first memory means for containing binary data indicative of a plurality of horizontal elements of a model image;

second memory means for storing a data word group descriptive of at least the eccentricity and display screen location of said elliptical image;

first combining means coupled to said second memory means and resposive to at least a portion of said data word group for forming first address signals and for applying said address signals to said first memory means to access therefrom said binary data indicative of selected ones of said horizontal elements of said model image for each horizontal scan line used to form said elliptical image;

second combining means coupled to said first and second memory means and responsive to a remaining portion of said data word group and said accessed binary data to form therefrom second address signals indicative of the location of said horizontal elements on said display screen;

random access memory means coupled to said second combining means and responsive to said second address signals for storing marker information at memory locations corresponding to positions on the display screen; and

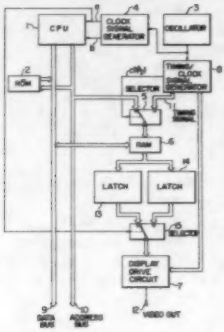
means accessing said random access memory means in synchronism with said scanning electron beam.

4,388,621

DRIVE CIRCUIT FOR CHARACTER AND GRAPHIC DISPLAY DEVICE

Shigeru Komatsu; Shigeru Hirahata, and Tsuguji Tachiuchi, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 10, 1980, Ser. No. 158,263
Claims priority, application Japan, Jun. 13, 1979, 54-73558
Int. Cl.³ G09G 1/00
U.S. Cl. 340—802 3 Claims



1. A drive circuit for a character and graphic display device comprising:

(a) a central processing unit (CPU);

(b) a basic clock pulse generator having an output terminal for providing basic clock pulses;

(c) a CPU clock signal generator having an input terminal connected to said output terminal of said basic clock pulse generator and an output terminal for providing a CPU clock signal in the form required by said CPU, for generating a CPU clock signal based on said clock pulses;

(d) a display timing signal/clock signal generator including a means having an input terminal connected to said output terminal of said basic clock pulse generator and an output terminal for providing a display clock signal, for generating said display clock signal based on said basic clock pulses, said display clock signal having a first period of shorter duration and a second period of longer duration, and means having an output terminal for providing a display timing signal, for generating said display timing signal required by said character and graphic display device based on said basic clock pulses;

(e) a common display/data memory means having an input terminal for receiving an address signal, an input terminal connected to a data bus of said CPU and an output terminal for providing a display data signal corresponding to the address signal, said memory means including a display memory and a data memory in a common area;

(f) a first selecting switch for selectively connecting one of said address bus of said CPU and said output terminal of said timing signal/clock signal generator providing said display timing signal to said input terminal of said memory means; said selecting switch having a control input terminal connected to said output terminal providing said display clock signal and being actuated by said display clock signal to connect said address bus to said input terminal of said memory means during said first period;

(g) a first latch circuit having an output terminal and an input terminal connected to said output terminal of said memory means for latching a display data signal corresponding to an applied even number address signal;

(h) a second latch circuit having an output terminal and an input terminal connected to said output terminal of said memory means for latching a display data signal corresponding to an applied odd number address signal;

(i) a display drive circuit having an input terminal for receiving said display data signal, an input terminal connected to said output terminal of said timing signal/clock signal generator providing said display timing signal and an output terminal for providing a video signal, for producing said video signal in accordance with the applied display data signal and display timing signal; and

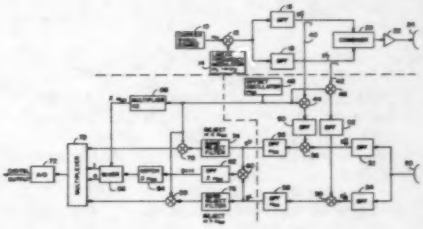
(j) means including a second selecting switch responsive to a clock signal generated on the basis of said basic clock pulses for alternately connecting said output terminal of said first latch circuit and said output terminal of said second latch circuit to said input terminal of said display drive circuit receiving said display data signal.

4,388,622

DOUBLE SIDEBAND LINEAR FREQUENCY MODULATION SYSTEM FOR RADAR APPLICATIONS

Robert H. Fletcher, Jr., Westlake Village, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 15, 1981, Ser. No. 254,237
Int. Cl.³ G01S 13/34, 13/58
U.S. Cl. 343—14 7 Claims



1. In a radar system wherein a continuous wave of electromagnetic energy is transmitted toward an object and reflected energy is received from the object, the improvement of a double sideband linear frequency modulation system comprising: transmitting means providing upper and lower sidebands of a carrier signal with simultaneously increasing and decreasing transmitted frequency waveforms; receiving means adapted for receiving reflected portions of said transmitted waveforms, and for separating said reflected portions into said upper and lower sidebands of said carrier signal, said upper and lower portions of reflected energy having both range and doppler signal components therein simultaneously; and signal processing means for coherently combining the reflected sideband portions for separating the range and doppler signal components, said signal processing means comprising a first mixer having inputs adapted for receiving said reflected sideband portions for providing a sideband sum output, and a notch filter responsive to said sum output for eliminating clutter and thereby enhancing the frequency component of the signal output therefrom for determining radial velocity of the object.

4,388,623

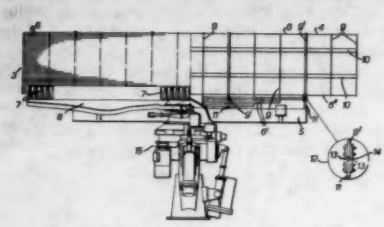
ANTENNAS

Richard W. Crook, Coalville, and Ian Coghill, Cannock, both of England, assignors to The Marconi Company Limited, Chelmsford, England

Filed Jun. 26, 1980, Ser. No. 165,952
Claims priority, application United Kingdom, Jun. 28, 1979, 7922563; Nov. 19, 1979, 7939908
Int. Cl.³ H01Q 1/34, 19/12
U.S. Cl. 343—709 15 Claims

1. An antenna having a relatively large area reflector formed

of a plurality of conductive slats having air gaps therebetween wherein said slats are formed of carbon fibre re-inforced plas-



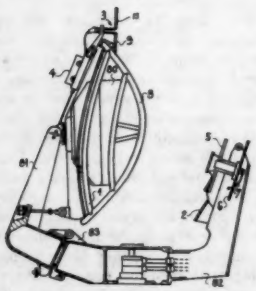
tics material, with said material providing the reflective surfaces of said slats for energy incident thereupon.

4,388,624

RADAR ANTENNA INCORPORATING ELEMENTS RADIATING A PSEUDO-OMNIDIRECTIONAL PATTERN

Albert Dupressoir, Paris, France, assignor to "Thomson-CSF", Paris, France

Filed Oct. 23, 1980, Ser. No. 199,992
Claims priority, application France, Oct. 26, 1979, 79 26609
Int. Cl.³ H01Q *5/00, 25/00*
U.S. Cl. 343—727 **6 Claims**



1. A radar antenna comprising:

a reflector illuminated by at least one transmission-reception source, one of said at least one transmission-reception source radiating a directional pattern; and

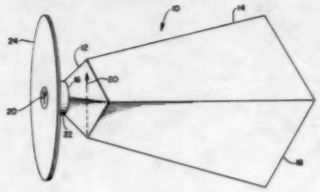
a system of elements radiating a pattern of the pseudo-omnidirectional type with a crevasse in the direction of the major lobe of the directional pattern radiated by one of said at least one transmission-reception source, wherein the system of radiating elements is constituted by at least one group of two dipoles placed above and in the vicinity of the reflector, symmetrically with respect to the plane of symmetry thereof, the distance between two consecutive dipoles being between 0.5 and 0.8 times the wavelength at the center frequency of the operating band, in such a way that they radiate towards the front thereof and independently thereof a pseudo-omnidirectional pattern.

4,388,625

MULTIMODE DIAGONAL FEED HORN

Helmut Schwartz, Satellite Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 12, 1981, Ser. No. 223,433
Int. Cl.³ H01Q *13/02*
U.S. Cl. 343—786 **10 Claims**



1. A pyramidal microwave horn for receiving or transmitting microwave energy comprising:

means for propagating microwave energy through said horn such that said microwave energy will have a mode of propagation having an electrical vector which is parallel to one of the diagonals of first and second differently flaring pyramidal sections of said pyramidal horn; and

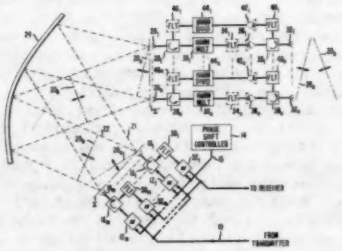
means for tapering said microwave energy propagating through said horn to equalize the beam widths of the antenna pattern in the intercardinal planes with the beam widths in the E and H planes and to reduce cross-polarized lobes in the intercardinal planes.

4,388,626

PHASED ARRAY ANTENNAS USING FREQUENCY MULTIPLICATION FOR REDUCED NUMBERS OF PHASE SHIFTERS

Michael J. Gans, Monmouth Beach, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 5, 1981, Ser. No. 240,765
Int. Cl.³ H01Q *3/46*
U.S. Cl. 343—854 **6 Claims**



1. A phased array antenna system comprising:

a focusing means (**24**) comprising a predetermined aperture;

a plurality of m feed elements (18_1–18_m) disposed to form a first planar array directed at the focusing means; and

a plurality of m phase shifters (12_1–12_m or 52_1–52_m), each phase shifter being coupled to a separate one of the plurality of m feed elements and capable of introducing a particular separate phase shift to a signal in a first frequency band propagating therethrough in response to a remotely generated control signal to permit a particular directional planar wavefront to be launched or received by the feed elements of the first planar array

characterized in that

the antenna system further comprises:

a first plurality of n feed elements (26_1–26_n) forming a sec-

ond planar array disposed to cover the aperture of, and directed at, the focusing means on the image plane of the first planar array, where m<n;

a second plurality of n feed elements (32_1–32_n) forming a third planar array comprising a configuration corresponding to the second planar array and covering the aperture of, and directed away from, the focusing means; and

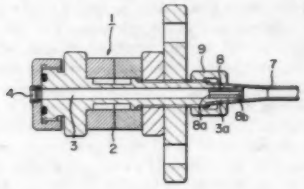
a plurality of n harmonic frequency converting means (30_1–30_n or 44_1–44_n), each harmonic frequency converting means being disposed in a signal path interconnecting a separate corresponding feed element of the second and third planar arrays for converting the frequency of a signal between a first frequency band normally associated with the signal at the feed element of the second planar array and a harmonic second frequency band which is higher than said first frequency band and normally associated with the signal at the feed element of the third planar array.

4,388,627

INK-JET PRINTING HEAD

Michio Umezawa, Kawasaki, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,688
Claims priority, application Japan, Dec. 27, 1980, 55-185034
Int. Cl.³ G01D *15/18*; B05B *17/06*
U.S. Cl. 346—75 **5 Claims**



1. An ink-jet printing head of the type in which the front end of an ink distribution tube is formed with a nozzle hole and the other end or spigot end portion thereof is inserted into one end of an ink supply tube and then joined rigidly and liquid-tightly thereto, characterized in that a resonance adjusting means has an ink passage which has a fine diameter and which is extended through said resonance adjusting means in the axial direction thereof, and said resonance adjusting means is inserted into said other end of spigot end portion of said ink distribution tube in such a way that the front end of said resonance adjusting means is spaced apart from said nozzle hole at said one end of said ink distribution tube by a distance equal to a resonance distance of ink in said ink distribution tube and thereafter is securely joined to said the other end of spigot end portion.

4,388,628

MULTI-COLOR THERMAL TRANSFER RECORDER

Haruhiko Moriguchi; Yoshiki Kikuchi, and Takashi Ohmori, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1981, Ser. No. 295,297
Claims priority, application Japan, Sep. 1, 1980, 55-119719
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **11 Claims**

1. A multi-color, thermal transfer, recorder wherein a plurality of single-color images different in color from each other are recorded in superimposed fashion on a recording sheet producing an image in multiple colors, comprising:

a thermal recording head;

a roll disposed in an opposing relation to said thermal recording head;

an ink donor sheet adapted to travel through a contacting portion between said thermal recording head and said roll opposing said recording head; and

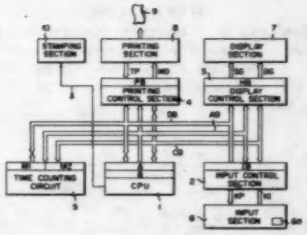
said ink donor sheet having two or more layers of single-color ink different in color from each other, each of said two or more ink layers having a length equal to a length of an outer circumference of said opposing roll.

4,388,629

NOTE-PAPER SHEET ISSUANCE DEVICE

Seiichi Shibata, Hirasaki, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,411
Claims priority, application Japan, Nov. 30, 1979, 54-155823
Int. Cl.³ G01D *1/00*
U.S. Cl. 346—81 **11 Claims**



1. An apparatus for issuing note-paper sheets of substantially the same predetermined size, comprising:

a keying secton having a note-paper sheet issuance key which is operable to initiate issuance of a note-paper sheet;

a central processing unit coupled to said keying section;

a time counting circuit coupled to said central processing unit for automatically providing at least present time data such as present hour and minute data; and

a printing section coupled to said central processing unit;

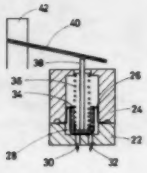
said central processing unit being responsive to operation of said note-paper issuance key for causing said printing section to perform a printing operation of printing said present time data at a predetermined location on a paper sheet at the time of issuance of a note-paper sheet and also a feeding operation to feed said paper sheet by a predetermined number of lines without printing for said predetermined number of lines for providing a blank message-recording space of predetermined length on said paper sheet before the start of or after the end of the printing operation at the time when said note-paper sheet issuance key is operated, thereby providing a note-paper sheet of substantially the same length each time said note-paper sheet issuance key is operated.

4,388,630

INK LIQUID SUPPLY SYSTEM WHICH COMPENSATES FOR TEMPERATURE VARIATION

Mikio Osaki, Kashihara; Toshiaki Tabuchi, and Yoichi Shimazawa, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1981, Ser. No. 242,554
Claims priority, application Japan, Mar. 22, 1980, 55-37699
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R 6 Claims



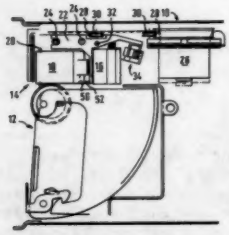
1. An ink supply system for an ink jet printer including a pump means, a pressure accumulator for removing a pressure pulsation created by said pump means and a pressure compensation temperature-sensitive means for varying the pressure within said pressure accumulator in response to variations of ambient temperature even when the main power supply to the system is interrupted, placing the system in a non-operative condition.

4,388,631

CHART RECORDER

John Houldsworth, Washington, Nr. Pulborough, England, assignor to Chessell Limited, Worthing, England

Filed Mar. 12, 1981, Ser. No. 243,055
Int. Cl.³ G01D 9/34, 15/24
U.S. Cl. 346—141 11 Claims



1. A chart recorder for producing a record of a plurality of 2 parameters, the recorder comprising;

means for supporting a recording medium and for feeding the same forward;

a writing head; means mounting the writing head for movement transversely of the recording medium, and means for moving the writing head transversely of the recording medium;

a rotatable holder forming part of the writing head;

a plurality of writing tip means supported by the 11 rotatable holder and circumferentially spaced about the 12 periphery of the rotatable holder; and

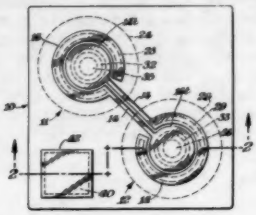
an axial field motor movable transversely with the rotatable holder, for rotating the rotatable holder to 15 select a writing tip means in dependence upon parameter being recorded.

4,388,632

SIGNAL LIMITING INTEGRATED CIRCUIT

William E. Richardson, Rutland, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Oct. 3, 1980, Ser. No. 193,788
Int. Cl.³ H01L 27/04, 29/48
U.S. Cl. 357—15 3 Claims



1. A signal limiting integrated circuit comprising a silicon body of one conductivity type, an epitaxial layer on said body being lightly doped with impurities of the opposite conductivity type, an isolation wall through said epitaxial layer being heavily doped with impurities of said one type forming only two pockets of unaltered epitaxial material, only first, second and third metal films overlying said epitaxial layer,

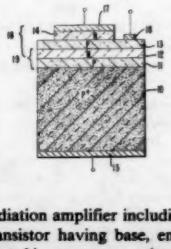
said first metal film making Schottky barrier contact to one of said pockets and ohmic contact to the other of said pockets, said second metal film making Schottky barrier contact to said other of said pockets and ohmic contact to said one pocket, each of said first and second metal films having an enlarged termination portion located directly over said pocket to which said Schottky barrier contact is made, said third metal film consisting of an enlarged termination located directly over an enlarged portion of said isolation wall and making ohmic contact thereto.

4,388,633

MONOLITHIC TRANSISTOR COUPLED ELECTROLUMINESCENT DIODE

Prahalad K. Vasudev, Santa Monica, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 29, 1980, Ser. No. 191,558
Int. Cl.³ H01L 33/00; H01S 33/19; H01L 27/14, 29/161
U.S. Cl. 357—17 17 Claims



1. An optical radiation amplifier including:

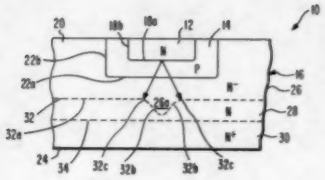
(a) a bipolar transistor having base, emitter and collector regions connected in a common emitter configuration; and

(b) a light emitting device having regions of opposite conductivity forming a p-n junction, said light emitting device connected to said collector in a monolithic fashion.

4,388,634
TRANSISTOR WITH IMPROVED SECOND BREAKDOWN CAPABILITY

Robert Amantea, Griggstown, N.J., and Carl F. Wheatley, Jr., Drums, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 4, 1980, Ser. No. 212,813
Int. Cl.³ H01L 29/72
U.S. Cl. 357—34 2 Claims

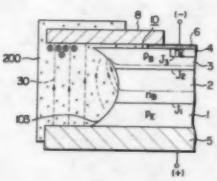


1. A transistor comprising an emitter of a first conductivity type, a base of a second conductivity type and a collector of said first conductivity type, said emitter and said base forming a first junction adjacent a first surface of said transistor, and said base and said collector forming a second junction between said first junction and a second surface of said transistor, said collector including (a) a first region of relatively high resistivity material including a channel portion extending toward said second surface adjacent the central portion of said emitter, (b) a second region of lower resistivity material forming a first interface with the higher resistivity material of said first region, said first interface including a first portion extending around said channel portion, said first portion being located laterally inwardly of the outer edges of said emitter, and (c) a third region of lowest resistivity material extending from said second surface toward said second junction, said second region and said third region forming a second interface between said first interface and said second surface and wherein said channel portion terminates adjacent said second interface.

4,388,635
HIGH BREAKDOWN VOLTAGE SEMICONDUCTOR DEVICE

Atsuo Watanabe, Hitachi; Masayoshi Naito, Katsuta; Tsutomu Yatsuo, and Masahiro Okamura, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 1, 1980, Ser. No. 164,946
Claims priority, application Japan, Jul. 2, 1979, 54-82650; Jul. 6, 1979, 54-84996; Mar. 5, 1980, 55-26638; Mar. 5, 1980, 55-26642; Mar. 5, 1980, 55-26643
Int. Cl.³ H01L 29/74
U.S. Cl. 357—38 21 Claims



1. A semiconductor device comprising;
a semiconductor substrate having a pair of major surfaces and a side surface;
a pair of main electrodes adjacent to said pair of major surfaces of said semiconductor substrate;
a pair of conductive members electrically connected to said pair of main electrodes and arranged externally to the peripheral edges of said pair of major surfaces of said semiconductor substrate, at least one of the conductive members having an opening at a central portion to expose at least part of the main electrode connected to said conductive member; and
a passivation material disposed to contact to said side surface of said semiconductor substrate and said pair of conductive members.

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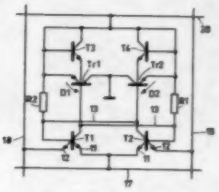
STATIC MEMORY CELL AND MEMORY CONSTRUCTED FROM SUCH CELLS

Jan Lohstroh, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 28, 1980, Ser. No. 182,260
Claims priority, application Netherlands, Sep. 11, 1979, 7906752
Int. Cl.³ H01L 27/12, 29/72, 27/02
U.S. Cl. 357—49 4 Claims



1. A static bipolar memory cell comprising:
A. a semiconductor body of a first conductivity type having a surface-adjoining surface layer of one conductivity type comprising first and second juxtaposed mutually-insulated islands which are separated from the remainder of the semiconductor body on their lower sides by first and second buried layers of a second conductivity type opposite to that of the first, said buried layers having a lower resistivity than that of said surface layer;
B. first and second transistors in said first and second islands, respectively, which transistors each comprise a base zone of said first conductivity type, at least one surface-adjoining emitter zone of the second conductivity type and a collector zone of the second conductivity type which is formed at least partly by the associated buried layer of the second conductivity type;
C. cross-links between the base zone of the first transistor and the collector zone of the second transistor and between the base zone of the second transistor and the collector zone of the first transistor;
D. first and second load elements between a supply line and the collector zones of the first and the second transistors, respectively, which load elements each comprise a resistor and a diode connected in parallel, the resistors of the first and the second load elements, respectively, being formed by a resistance region of the first conductivity type extending between the base zone of the second transistor and a supply connection in the second island and by a resistance region of the first conductivity type extending between the base zone of the first transistor and a supply connection in the first island, the diodes of the first and second load elements being formed by the p-n junctions between the buried layer below the first island and the resistance region in the first island, and between the buried layer below the second island and the resistance region in the second island, respectively;
E. third and fourth transistors in the first and second islands, respectively, at the area of the said supply connections, which transistors comprise a base zone of the first conductivity type and an emitter zone and a collector zone of the second conductivity type, the emitter-base junctions of said transistors being formed by said p-n junctions between the buried layers of the second conductivity type

and the resistance region of the first conductivity type, the collector zones of said transistors being formed by surface zones of the second conductivity type which are provided in the resistance regions and which form p-n junctions with the resistance regions, said collector-base junctions being short-circuited by the supply connections.

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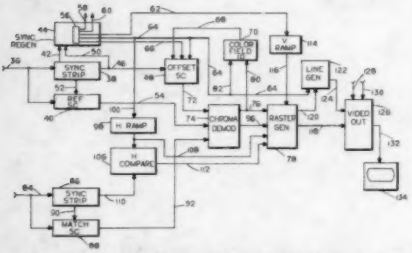
VIDEO SIGNAL MONITORING DEVICE AND METHOD

Bruce A. Blair, Jackson, Mo., assignor to Lenco, Inc., Jackson, Mo.

Filed Jun. 8, 1981, Ser. No. 271,703
Int. Cl.³ H04N *9/62*
U.S. Cl. 358—10 **42 Claims**



11. A device for monitoring video signals having a train of sync pulses and intermittent bursts of a subcarrier signal therebetween with a subcarrier burst located between individual ones of said sync pulses, said device comprising:

a first circuit having an input operatively connectable to a source of a video signal to be monitored, a first oscillator for generating a first continuous signal in phase with the intermittent subcarrier burst signals of the video signal and an output;

a secod circuit having an input operatively connectable to the source of a video signal to be monitored, a second oscillator for generating a second continuous signal in phase with selected ones of the sync pulses of the video signal and an output;

a third circuit having a first input connected to the output of the first circuit, a second input connected to the output of the second circuit, said third circuit including means for demodulating the first signal with the second signal to produce a third signal having a phase related to the phase difference between the first and second signals and an output; and,

means connected to the output of the demodulating means for displaying the third signal.

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DE-EMPHASIS FOR DIGITIZED COMPOSITE COLOR TELEVISION SIGNALS

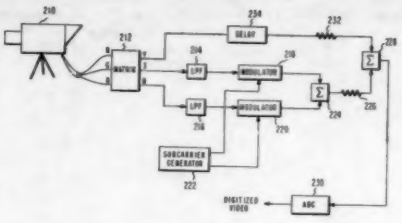
Robert A. Dischert, Burlington, and Glenn A. Reitmeier, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 19, 1981, Ser. No. 226,387
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—27 **4 Claims**

1. A method for generating a digital signal representative of a composite color television signal, the method comprising:

generating a luminance signal component having a predetermined value when representing a white image;

generating a chrominance signal component having a value such that when combined with the value of said luminance signal the peak value of the combined signal for any saturated color of the image does not exceed said predetermined value; and



combining said luminance and chrominance signal components.

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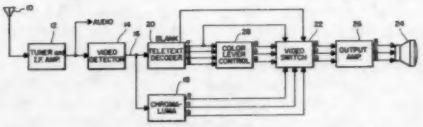
COLOR CONTROL CIRCUIT FOR TELETEXT-TYPE DECODER

Charles M. Cox, Buffalo Grove, and Rudolf Turner, Vernon Hills, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed May 18, 1981, Ser. No. 264,773
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—27 **5 Claims**



1. A color control circuit for selectively modifying the red, green and blue color signals developed at the output of a teletext-type decoder, said teletext-type decoder further developing a bi-level output control signal identifying the portions of said color signals representing background and foreground display information, said color control circuit comprising:

means responsive to said bi-level output control signal for developing at a common circuit node a control voltage having a first level identifying portions of said color signals representing background display information and a second level identifying portions of said color signals representing foreground display information; and

output means comprising a red output stage, a green output stage and a blue output stage, each of said output stages summing the control voltage developed at said common circuit node with the corresponding one of said red, green and blue color signals for causing the respective color signal to assume a first intensity level when the control voltage developed at said common circuit node is at said first level and a second intensity level greater than said first intensity level when the control voltage developed at said common circuit node is at said second level.

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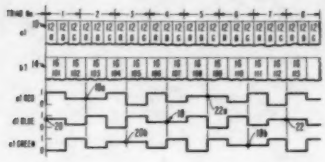
COLOR FILTER HAVING VERTICAL COLOR STRIPES WITH A NONINTEGRAL RELATIONSHIP TO CCD PHOTOSENSORS

Roland N. Rhodes, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 118,301, Feb. 4, 1980, Pat. No. 4,277,801.
This application Dec. 5, 1980, Ser. No. 213,302
Int. Cl.³ H04N *9/07*
U.S. Cl. 358—44 **4 Claims**

1. A method of demodulating a signal obtained from an

imager having discrete photosensors and a vertical stripe filter disposed in front of said imager, said filter stripes being arranged in horizontally repeating cycles of color order, the ratio of the width of a cycle to the width of a photosensor being a



non-integer between one and three so that the signal has a suppressed carrier signal, and upper and lower subcarriers; said method comprising demodulating the information modulated on at least one of said subcarriers.

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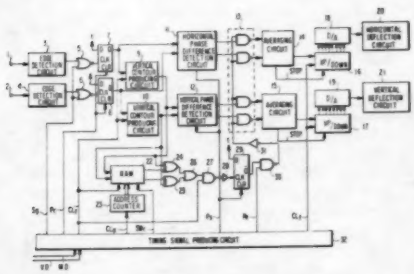
CENTERING UNIT FOR A COLOR TELEVISION CAMERA APPARATUS HAVING PLURAL PICK-UP TUBES

Setsuo Yamamoto, and Yasuichi Ushiyama, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,546
Claims priority, application Japan, Mar. 31, 1980, 55/41684
Int. Cl.³ H04N 9/09
U.S. Cl. 358—51 **9 Claims**



1. A centering unit for a color television camera apparatus having plural pick-up tubes corresponding to different color channels comprising:

means for auto correlating signals representative of video signals of the same color channel occurring at discrete detection areas on television screens to produce correlation signals for the respective detection areas when correlation is detected for each area, said signals being correlated over a time period of at least one frame period,

means for detecting a phase difference between video signals corresponding to two different color channels in each of said plural detection areas to produce phase difference signals for the respective detection areas;

gate means for passing said phase-difference signals derived from said phase difference detecting means in response to said correlation signal for corresponding detection areas to the respective phase difference signals;

means for averaging the phase difference signals passed through said gate means over said plural detection areas; and

means for producing a correction voltage in accordance with the output of said averaging means to shift a deflection timing of at least one of said two different color channels.

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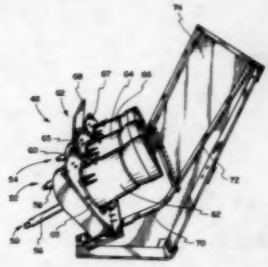
HEAT SINKING MEANS AND METHOD FOR PROJECTION TELEVISION CRTS

James J. Reno, Jr., Schaumburg, and Richard G. Schmid, Glenview, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 6, 1981, Ser. No. 280,398
Int. Cl.³ H04N 9/31
U.S. Cl. 358—60 **6 Claims**



4. A dry heat sink assembly for use in a projection television system having red, green, and blue television image source means including three cathode ray picture tubes each with an associated projection lens means for projecting into coincidence respective red, green, and blue images to form a composite color image on a viewing screen of said system, each tube having a glass face plate on the inner surface of which is deposited a cathodoluminescent screen for forming one of said television images, each of said face plates developing an undesirably high temperature during operation resulting in thermal cracking, with said tube forming said green image developing a higher faceplate temperature than said other two tubes, each of said projection lens means having a front face and a heat-deformable rear face disposed closely adjacent to the face plate of said tube associated therewith, said heat sink assembly comprising:

a rectangular metallic heat-conductive panel located between each of said face plates and said rear face of the associated projection lens means and in intimate contact with said face plate and in close proximity to said heat-deformable rear face of said associated lens means, each of said panels having a large area relative to the area of the face plate associated therewith and having vertically extending extremities, each of said panels having a window therein in coincidence with its associated cathodoluminescent screen for passing the television image to said screen;

and means for maintaining each of said heat-conductive panels in intimate contact with said associated face plate and with said panel extremities extending beyond the perimeter of said associated face plate so that each of said heat-conductive panels, solely, by conduction and radiation and without reliance upon ancillary cooling apparatus conducts heat from its associated face plate to inhibit thermal cracking of said associated face plate, and to inhibit deforming of said heat-deformable rear face of said associated projection lens.

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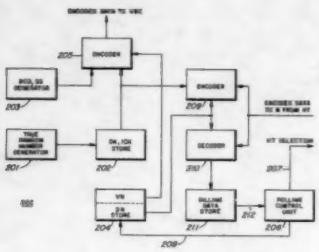
METHOD OF CONTROLLING SCRAMBLING AND UNSCRAMBLING IN A PAY TV SYSTEM

Yehuda J. Aminetzah, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 6, 1981, Ser. No. 251,085
Int. Cl.³ H04N 7/16; H04L 9/00
U.S. Cl. 358—123 **11 Claims**



1. A method of controlling scrambling and unscrambling of a video signal in a pay TV system, comprising the steps of:

storing a subscriber number at a subscriber station;

recurrently transmitting to the subscriber station a first variable encoded in dependence upon the subscriber number;

decoding the first variable at the subscriber station using the stored subscriber number, and storing the first variable before or after said decoding;

scrambling the video signal in dependence upon the first variable and a second variable;

transmitting the second variable to the subscriber station simultaneously with transmission of the scrambled video signal; and

at the subscriber station, unscrambling the video signal in dependence upon the decoded stored first variable and the transmitted second variable.

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APPARATUS FOR MONITORING A MULTICHANNEL RECEIVER

Neal H. Ishman, Springfield; Robert B. Buxton, Burke; Duane A. Durst, Sterling; James F. McArthur, and Michael E. Johnson, both of Falls Church, all of Va., assignors to E-Systems, Inc., Dallas, Tex.

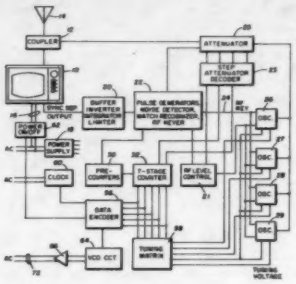
Continuation of Ser. No. 733,164, Oct. 18, 1976, Pat. No. 4,216,497. This application Feb. 12, 1980, Ser. No. 120,927
The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.
Int. Cl.³ H04N 7/00; H04B 1/00
U.S. Cl. 358—84 **31 Claims**

1. A method of monitoring the operation of a multichannel television receiver comprising the steps of:

(a) injecting a signal into the input of the television receiver in synchronism with the television signal being received by the television receiver on the channel to which the television receiver is tuned;

(b) varying the frequency of the injected signal among frequencies unique for each channel of the television receiver;

(c) detecting the presence of an injected signal at the output of the television receiver to thereby provide an indication of a predetermined relationship between the frequency of the injected signal and the frequency of the television signal to which the television receiver is tuned and thus the channel to which the television receiver is tuned; and



(d) storing data related to the channel to which the television receiver is tuned for subsequent transmission to a location remote from the television receiver.

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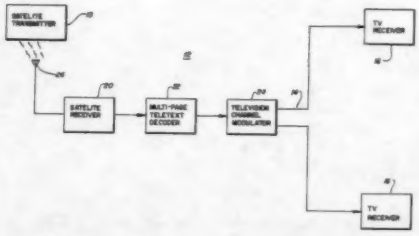
TELETEXT COMMUNICATION SYSTEM WITH TIMED MULTIPAGE LOCAL MEMORY

Charles M. Cox, Buffalo Grove, and William L. Thomas, Northbrook, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 13, 1981, Ser. No. 253,330
Int. Cl.³ H04N 7/08
U.S. Cl. 358—147 **20 Claims**



1. A teletext communications system comprising:

means transmitting multiple pages of a teletext encoded data service at selected times of the day, each of said teletext pages comprising a first non-displayable auxiliary teletext data row including a time-on code and a time-off code together defining a selected time interval and also including a unique page memory address code, said transmitting means continuously transmitting a second non-displayable auxiliary teletext data row including a current time of day code;

a teletext decoder having a plurality of page memories, each of said memories corresponding to the page memory address code of one of said teletext pages, said teletext decoder including means for acquiring and storing each of said transmitted teletext pages at the page memory corresponding to the page memory address code associated with the first auxiliary data row of the respective teletext page; and

means for automatically rebroadcasting each of said stored teletext pages for which said selected time interval coincides with the time of day code of said second auxiliary data row.

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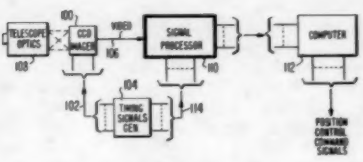
LOW-DISTORTION DETECTION OF PULSES SUPERIMPOSED ON AN UNKNOWN AND VARIABLE BACKGROUND SIGNAL

John A. Strother, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 271,035
Int. Cl.³ H04N 5/21
U.S. Cl. 358—160 **8 Claims**



1. Pulse detection apparatus responsive to an applied analog time signal comprising an unknown and variable level, relatively low-frequency background components on which is superimposed one or more relatively high-frequency pulse components, in which the significant features of interest of each pulse are characterized by its shape, amplitude and time of occurrence characteristics; said apparatus comprising:

first means including storage means responsive to a running segment of given duration of the immediate past history of the level of an input signal to said first means for deriving a pedestal signal at a predicted present level of said input signal to said first means said predicted present level of the input signal to the first means being a function of the D.C. level and the slope of said running segment,

switch means operative in a first switch position thereof for applying said analog time signal as said input signal to said first means and operative in a second switch position thereof for applying said pedestal signal as said input signal to said first means,

second means for subtracting said pedestal signal from the actual present level of said analog time signal to derive a difference signal,

third means responsive to the level of said difference signal with respect to a given threshold level for deriving a status signal indicative of whether or not the level of said difference signal is equal to or exceeds said given threshold level,

fourth means coupled between said third means and said switch means for maintaining said switch means in its second switch position whenever the level of said difference signal is equal to or exceeds said threshold level and for maintaining said switch means in its first switch position whenever the level of said difference signal is below said threshold level, and

output means responsive to said difference signal and said status signal for deriving one or more outputs from the pulse detection apparatus which are indicative of at least one of said characteristics of each pulse.

2. The pulse detection apparatus defined in claim 1,

wherein said analog time signal is comprised of a stream of successive pixels of a scanned image field in which each individual pixel corresponds to a different particular location within the image field, each pulse having a duration equal to a plurality of successive pixels;

wherein said output means includes fifth means for deriving a first output signal having a value during each one of said plurality of successive pixels which is indicative of the value of said difference signal during that pixel and sixth means for deriving a second output signal having a value during each one of said successive pixels which is indicative of the particular location corresponding to that pixel.

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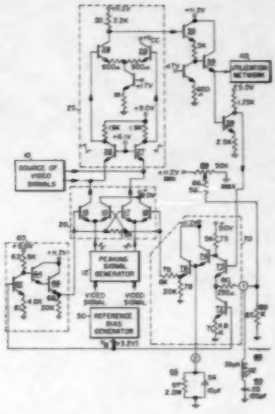
PREDICTABLY BIASED DC COUPLED VIDEO SIGNAL PEAKING CONTROL SYSTEM

Leopold A. Harwood, Bridgewater, N.J.; Robert L. Shanley, II, and James Hettiger, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,137
Int. Cl.³ H04N 5/14
U.S. Cl. 358—166 **8 Claims**



1. Direct current coupled apparatus for controlling the high frequency peaking content of a video signal, comprising:

a source of complementary phased video signals;

means responsive to video signals from said source for generating complementary phased video signal peaking components;

control means responsive to said peaking components and having differential control inputs, for providing controllable amounts of said complementary phased peaking components at an output in response to a control voltage applied to said control inputs;

means for differentially combining said complementary phase video signals with said controllable amounts of said complementary phase peaking components to produce a controllably peaked video signal;

a source of quiescent DC bias voltage;

first and second mutually symmetrical bias coupling networks coupled to said voltage source, for supplying balanced quiescent DC bias voltages derived from said voltage source to said differential control inputs of said control means, respectively; and

detector means for developing said control voltage in response to the high frequency content of said video signal, said detector means comprising a semiconductor device included in said first bias coupling network.

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FREQUENCY SELECTIVE DC COUPLED VIDEO SIGNAL CONTROL SYSTEM INSENSITIVE TO VIDEO SIGNAL DC COMPONENTS

Leopold A. Harwood, Bridgewater, N.J.; Robert L. Shanley, II, and James Hettiger, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,138
Int. Cl.³ H04N 5/14
U.S. Cl. 358—166 **10 Claims**

5. Apparatus for automatically controlling the high frequency peaking content of a video signal including high frequency and DC components, said apparatus comprising:

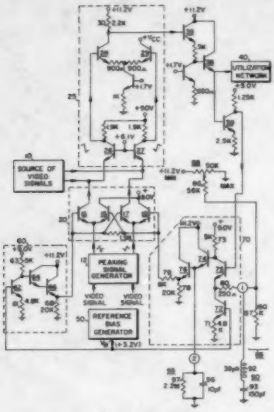
peaking means responsive to said video signal for generating a peaking component;

means for combining said video signal with said peaking component to produce a peaked video signal;

a DC coupled control path with an input responsive to said video signal and an output coupled to said peaking means, comprising

an amplifier with an input for receiving said video signal including high frequency and DC components, and an output;

a detector coupled to said amplifier output for producing



a control voltage representative of the magnitude of output signals from said amplifier; and

means for coupling said control voltage to said peaking means for controlling the magnitude of said peaking component and thereby the peaking content of said peaked video signal; and

filter means coupled to said amplifier in said DC coupled control path for shaping the frequency response of said amplifier so that output signals from said amplifier as coupled to said detector comprise video signal high frequency components within a given range of frequencies substantially exclusive of DC components.

4,388,649

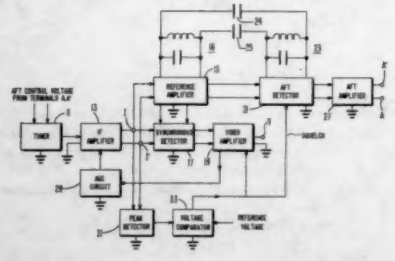
AFT LOCKOUT PREVENTION SYSTEM

Jack R. Harford, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,914

Int. Cl.³ H04N 5/50

U.S. Cl. 358—195.1 **7 Claims**



1. In a television receiver including a tuner providing an IF output signal representative of a frequency converted version of RF signals selectively amplified thereby; an IF amplifier having an input responsive to said IF output signal of said tuner and having a gain subject to control in accordance with variations of a gain control potential; a synchronous detector responsive to signals amplified by said IF amplifier for recovering video signal information therefrom; an automatic gain control system responsive to an output of said synchronous detector for developing said gain control potential; and an automatic fine tuning system, including an AFT detector responsive to signals derived from an output of said IF amplifier, for providing a tuning control voltage for said tuner; apparatus comprising the combination of:

a peak detector, responsive to said output of said IF amplifier, and independent of said synchronous detector and said automatic gain control system, for developing an output potential indicative of a peak value attained by signals apearing at said output of said IF amplifier; and

means, including a voltage comparator responsive to said output potential and to a reference voltage, for disabling said AFT detector when said output potential of said peak detector exceeds a threshold value determined by said reference voltage.

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TELEVISION RECEIVER AUDIO CHANNEL OPERATING ACCORDING TO THE INTERCARRIER SYSTEM

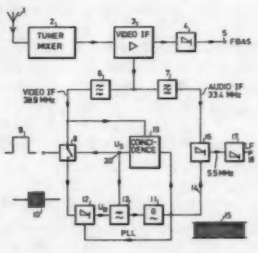
Burchard Schmidtmann, Barsinghausen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 8, 1981, Ser. No. 261,808

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017760

Int. Cl.³ H04N 5/62

U.S. Cl. 358—197 **4 Claims**



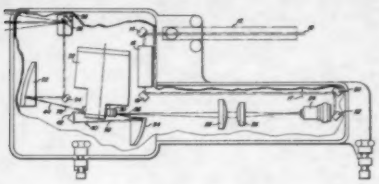
1. In a television receiver for receiving a signal including an audio IF carrier and a video IF carrier modulated with picture information, the receiver having an audio channel operating according to the intercarrier principle and including means connected to receive the video IF carrier for generating therefrom a mixed carrier constituted by the video IF carrier from which picture information modulation has been removed, and mixing means connected for generating an intercarrier frequency signal by mixing the audio IF carrier with the mixed carrier, the improvement comprising switch means connected for supplying the video IF carrier to said mixed carrier generating means only during the horizontal blanking periods of the television signal when the video IF carrier is free of picture information modulation, and wherein said mixed carrier generating means include a phase control loop connected to said switching means.

4,388,651

METHOD AND APPARATUS FOR GENERATING A SCANNED OPTICAL OUTPUT SIGNAL

Randy J. Sherman, Phoenix, Ariz., assignor to Lincoln Laser Co., Phoenix, Ariz.

Filed May 28, 1981, Ser. No. 267,678
Int. Cl.³ H04N *3/08*
U.S. Cl. 358—206 **13 Claims**



1. An optical scanner for generating a raster scan on a remotely positioned screen comprising:

a. a rotating mirror having a plurality of facets disposed around the mirror axis of rotation;

b. first directing means for receiving a coherent light input beam and for directing the light beam through a first optical axis onto the rotating mirror facets at a first position to produce a first scanned reflected output beam;

c. a first spherical mirror laterally centered about and positioned below the first optical axis for receiving the first scanned reflected output beam and for generating a second scanned reflected output beam which passes through a first pivot vertex;

d. second directing means for receiving the second scanned reflected output beam and for directing said beam back onto the rotating mirror facets at a second position spaced apart from the first position to generate an angularly amplified output beam passing through a first plane and having a sweep path symmetrically oriented with respect to a second optical axis;

e. focusing means for receiving and redirecting the angularly amplified output beam through a second pivot vertex; and

f. a single surface mirror repetitively deflected through an arc of less than ninety degrees and positioned in proximity to the second pivot vertex for receiving the angularly amplified output beam, for deflecting said beam through a second plane oriented perpendicular to the first plane, and for directing said beam onto the screen to form an optical scanner output beam.

4,388,652

SYNCHRONIZED, VARIABLE SPEED CAPSTAN MOTOR DRIVE SYSTEM FOR FACSIMILE RECORDER

Allen E. Dukes, West Melbourne, and David C. Bailey, Cocoa Beach, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

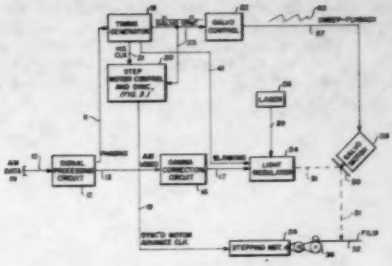
Filed Apr. 30, 1979, Ser. No. 34,975
Int. Cl.³ H04N *1/10, 1/12*
U.S. Cl. 358—285 **14 Claims**

1. In a facsimile recording apparatus, wherein an information recording scanning device is caused to scan a recording medium in line-by-line fashion as said recording medium is advanced in a stepwise manner, so that there are recorded on said recording medium a series of stepwise-diagonal traces of information on which a facsimile recording is composed,

the improvement comprising:

first means for generating a first signal representative of the position of said scanning device relative to a prescribed location on said recording medium; and

second means, responsive to said first signal generated by said first means, for causing each of the locations of adjacent transitions in the successively recorded traces, resulting from the stepwise advance of said recording medium,



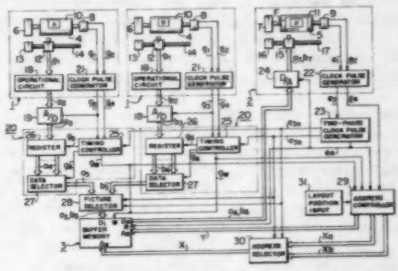
to be aligned with one another in the direction of advance of said recording medium.

4,388,653

METHOD FOR CONTROLLING WRITING TIMINGS OF PICTURE SIGNALS TO BE STORED IN A MEMORY

Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 26, 1980, Ser. No. 181,633
Claims priority, application Japan, Aug. 28, 1979, 54-108692
Int. Cl.³ H04N *1/22*
U.S. Cl. 358—302 **5 Claims**



1. A method for controlling writing timings of each of a plurality of picture signals to be written into and stored in a memory, said signals to be used in a picture reproducing machine wherein the picture signals picked up by picture scanning means are stored in the memory and then the picture signals are read out of the memory, and wherein reproduction pictures are recorded on a recording film by a reproduction recording means by using the picture signals read out, comprising the steps of:

(a) latching a plurality of the picture signals consecutively into a plurality of data storage latch circuits pre-positioned prior to the memory by a first clock pulse generated by the picture scanning means; and

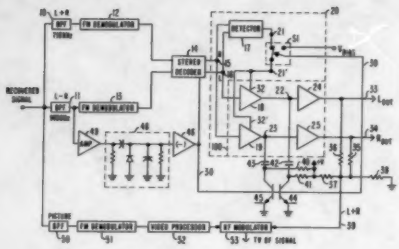
(b) writing into the memory each of the scanned picture signals read out of the latch circuits in the latching order by a timing control circuit processing a signal from a second clock pulse generated by the reproduction recording means and a pulse indicating latching of the next consecutive picture signal into one of said data storage circuits.

4,388,654

VIDEO DISC PLAYER WITH SELECTIVELY ENABLED AUDIO SIGNAL EXPANDER CIRCUITRY

Gopi N. Mehrotra, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 17, 1981, Ser. No. 244,665
Int. Cl.³ H04N *5/76*; H04B *1/64*
U.S. Cl. 358—343 **9 Claims**



1. In a video disc player of the type for recovering recorded signals including a first sound carrier modulated by a monophonic audio signal, and, when stereophonic signals are present modulated by the left plus right (L+R) audio signal, and, when stereophonic signals are present, including a second sound carrier modulated by the left minus right (L−R) audio signal and wherein the recorded stereophonic but not the monophonic modulating signals have been compressed during recording to effectively preserve dynamic signal range, said player including respective demodulating circuits for demodulating the sound carriers and stereophonic decoder circuitry responsive to the demodulated audio signals for producing at first and second decoder output terminals thereof respectively the left and right audio signals when stereophonic signal is recovered and producing monophonic signals at said first and second decoder output terminals when said first carrier is modulated by a monophonic audio signal, said player including expander circuitry responsive to the envelope of the audio signals at said first and second decoder output terminals for generating a time varying transfer function to restore said audio signals substantially to an uncompressed condition when stereophonic signals are recovered, said player further including means responsive to the absence of said second carrier for generating a control signal, and means responsive to said control signal for conditioning said expander circuitry to manifest a substantially time invariant transfer function during the absence of said second carrier.

4,388,655

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING VIDEO AND SOUND

George E. Zenzefilis, 27 Los Vientos, Camarillo, Calif. 93010

Continuation of Ser. No. 832,925, Sep. 13, 1977, abandoned. This application Aug. 16, 1979, Ser. No. 67,154
Int. Cl.³ H04N *5/78*; G11B *21/02*
U.S. Cl. 360—19.1 **54 Claims**

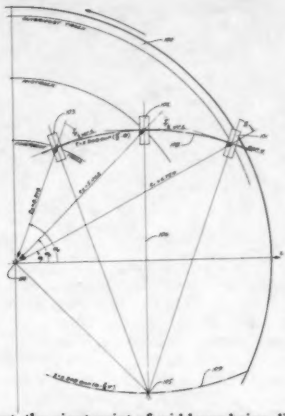
1. Apparatus for recording or reproducing video signals onto or from a recording disc, said apparatus comprising:

a recording disc;

means for rotating said recording disc at a constant rate about a center of rotation;

a first transducer for recording or reproducing video signals onto or from a selected portion of said recording disc, said first transducer being of the magnetic type and having a substantially straight recording gap for recording or reading imprints representing said video signals in a succession of tracks about the center of rotation, the imprints of the video signals for a given picture element being merged from track to track to form a continuous line intersecting different radii of the disc at substantially equal angles;

said first transducer being mounted on a pivoted lever, the gap of said first transducer being disposed substantially at right angles to said lever and tangent to the line to which



it is adjacent, the pivot point of said lever being displaced from said center of rotation and being selected so that motion of said lever about its pivot point will cause said gap to move along the lines of imprints; and

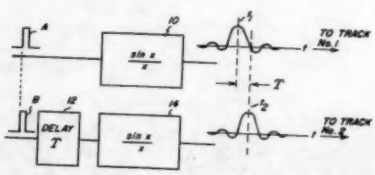
means for swinging said lever while said disc is being rotated.

4,388,656

MULTITRACK RECORDING WITH MINIMAL INTERMODULATION

James U. Lemke, Del Mar, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 3, 1980, Ser. No. 193,774
Int. Cl.³ H04N *5/785*; G11B *5/00*
U.S. Cl. 360—33.1 **31 Claims**



1. Multitrack recording apparatus for recording the information content of impulse signals comprising

(a) means for receiving a first impulse signal for transforming said first impulse signal into a damped ringing signal having a signal waveform having a period τ between successive zero crossings thereof,

(b) means for receiving a second impulse signal for transforming said second impulse signal into a damped ringing signal having a signal waveform having a period τ between successive zero crossings thereof, and

(c) multitrack recording means adapted to receive the transformed first and second impulse signals for so recording said transformed signals in respective tracks of a recording medium that the principal peaks of said two transformed signals occur at spaced apart locations of said medium,

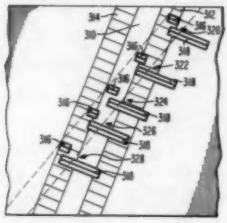
which locations are such that the principal peak of one transformed signal occurs proximate a zero crossing of the other, and vice versa, thereby minimizing intermodulation between said recorded signals.

4,388,657

SEARCH-MODE ARRANGEMENT FOR VTR

Lee V. Hedlund, Maple Shade; Donald G. Herzog, Collingswood, and Franz L. Putzrath, Haddonfield, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 25, 1980, Ser. No. 210,154
Int. Cl.³ G11B *15/14*
U.S. Cl. 360—72.1 **5 Claims**



1. A search mode playback arrangement for a VTR wherein continuate information is recorded in adjacent tracks disposed angularly across the direction of tape travel, the arrangement comprising:

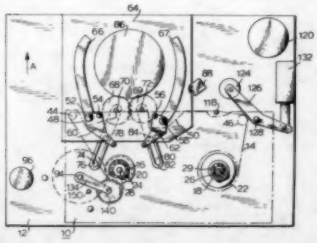
a pair of transducer gaps, and control means for alternately enabling said gaps in accordance with the amplitude of the reproduced signals from said gaps to continuously pickup coherent information while the playback arrangement scans across adjacent tracks, each said gap being selectively dimensioned and arranged relative to said other gap in accordance with the track format and the signal criteria adopted to alternately enable said gaps.

4,388,658

MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS

Jirou Kajino; Hitoshi Minabe, both of Neyagawa, and Shigeki Murata, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 4, 1980, Ser. No. 203,889
Claims priority, application Japan, Nov. 8, 1979, 54-144973
Int. Cl.³ G11B *5/08, 15/00*
U.S. Cl. 360—85 **4 Claims**



1. A magnetic tape recording and/or reproducing apparatus for recording and/or reproducing signals on a magnetic tape wound on reels contained in a tape cartridge, said apparatus comprising:

a reversible motor;

a pair of drive turntables engagable with the reels in the tape cartridge when the cartridge is inserted in said apparatus for rotating said reels;

tape loading means connected to said reversible motor for, when said reversible motor is rotated in one direction of rotation, being moved from an inoperative position to an operative position for drawing the magnetic tape out of the tape cartridge and loading the magnetic tape in a specific tape path in said apparatus, and, when said reversible motor is rotated in the other direction of rotation, being moved from the operative position to the inoperative position; and

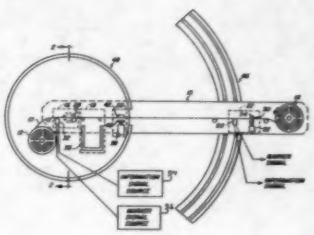
tape drawing-in means connected to and driven by said reversible motor when said reversible motor is rotated in said other direction and frictionally engaged with one of said reel drive turntables for driving said one reel drive turntable for drawing the magnetic tape back into the tape cartridge when said tape loading means is moved to the inoperative position.

4,388,659

TAPE RECORDER APPARATUS CAPABLE OF PLAYING BACK SELECTED INFORMATION WHILE RECORDING OTHER INFORMATION

James U. Lemke, Del Mar, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,331
Int. Cl.³ G11B *15/06, 5/78*
U.S. Cl. 360—90 **5 Claims**



1. Apparatus for recording information on a tape record medium and for reproducing the information recorded on a selected portion of the tape record medium without interrupting the recording of information, said apparatus comprising:

(a) a drum structure having a peripheral wall with an opening therein:

(b) means disposed within said drum structure for recording information on the tape record medium;

(c) means disposed outside said drum structure for playing back information peviously recorded on the tape record medium;

(d) means for feeding the tape record medium along a path which extends between said recording and reproducing means, and which tape path extends through said opening in the peripheral wall of said drum structure;

(e) means disposed in the tape path between said recording means and said opening in the peripheral wall of said drum structure for stopping the movement of a portion of the tape recording medium;

(f) means, operative in response to said tape stopping means for winding at least part of the tape record medium that extends from said tape stopping means to said reproducing means on said peripheral wall of said drum structure to bring the selected portion of the tape record medium into a position for playback by said playback means; and

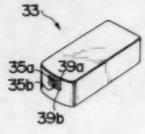
(g) means for unwinding the tape record medium from said drum structure to effect playback of the selected portion of the tape record medium.

4,388,660

TAPE RECORDER EMPLOYING MINIATURE TAPE CASSETTE AND CAPABLE OF AUTOMATIC REVERSIBLE OPERATION

Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Aug. 15, 1980, Ser. No. 178,527
Claims priority, application Japan, Sep. 25, 1979, 54/122754
Int. Cl.³ G11B *5/12, 15/00, 21/22, 5/27*
U.S. Cl. 360—110 **4 Claims**



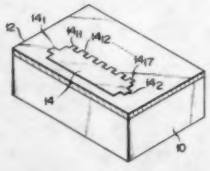
1. A tape recorder employing a miniature tape cassette and capable of automatic reversible operation, comprising a pair of spaced-apart record/playback magnetic heads, a first one of the heads including first means being disposed so as to be aligned with a track or tracks of a magnetic tape which are available for record or playback operation during the time a magnetic tape runs in a forward direction, a second one of the heads including second means being disposed so as to be aligned with a track or tracks of a magnetic tape on the magnetic tape which are available for record or playback operation during the time the tape runs in a reverse direction, said first and second magnetic heads being identical in structure and being disposed in an opposite orientation relative to each other, so that said first and second means are each aligned with a different track or tracks of said magnetic tape.

4,388,661

MULTICHANNEL MAGNETIC HEAD AND A MANUFACTURING METHOD THEREFOR

Yoshifumi Sakurai, Minoo, Japar., assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1980, Ser. No. 206,373
Claims priority, application Japan, Nov. 14, 1979, 54-147327
Int. Cl.³ G11B *5/38, 5/28, 5/22*
U.S. Cl. 360—112 **4 Claims**



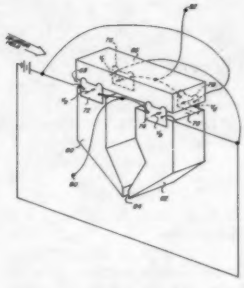
1. A multichannel magnetic head means comprising:
magnetic circuit means including a gap for detecting a magnetic flux (ϕ), for leading said magnetic flux;
an amorphous magnetic thin film held in said gap and consisting essentially of an alloy containing a rare earth element and a transition metal, said amorphous magnetic film having a single pair of current terminals and a plurality of spaced apart Hall voltage terminals;
current leading means connected to said pair of current terminals, for leading a biasing current of said thin film along said gap; and
voltage outputting means connected to said Hall voltage terminals, for outputting a Hall voltage for each channel corresponding to said magnetic flux, said voltage outputting means corresponding in number to the number of channels of the magnetic head and connected in a direction along the flow of said biasing current with a predetermined distance;
said amorphous magnetic thin film being arranged such that its film surface is substantially normal to the direction of traverse of the magnetic flux to be detected, and the composition ratio of said rare earth element is selected to be within a range of about 10 to 40 atomic % so that said amorphous magnetic thin film has a magnetic anisotropy in a direction normal to the surface thereof; and
the spacing between adjacent ones of said Hall voltage terminals being more than about four times the width of said amorphous magnetic thin film so that crosstalk between channels due to domain wall motion is substantially eliminated.

4,388,662

THIN FILM MAGNETORESISTIVE HEAD

Frederick Jeffers, Escondido, and Richard J. McClure, San Diego, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 28, 1981, Ser. No. 229,039
Int. Cl.³ G11B *5/12, 5/30*
U.S. Cl. 360—113 **9 Claims**



1. A magnetic head comprising
(a) first and second magnetic pole parts disposed to define a transducer gap therebetween,
(b) magnetic means positioned relative to said first and second pole parts and respectively forming therewith first and second high reluctance gaps therebetween,
(c) a first thin film magnetoresistive element magnetically coupling said magnetic means to said first pole part at said first gap, said first magnetoresistive element having a magnetization vector that is in the plane of its thin film, and
(d) a second thin film magnetoresistive element magnetically coupling said magnetic means to said second pole part at said second gap, said second magnetoresistive element having a magnetization vector that is in the plane of its thin film, the quiescent orientation of said second element magnetization vector being in substantially the same direction as the quiescent direction of the magnetization vector of said first element,
whereby magnetic flux entering said transducer gap causes a differential change in the electrical resistances of said first and second magnetoresistive elements, but spurious magnetic fields to which said head is exposed causes similar changes to the resistances of said first and second magnetoresistive elements.

4,388,663

CLEANING CASSETTE FOR A TAPE MACHINE

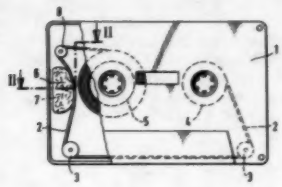
Peter Becella, Frankfurt am Main, Fed. Rep. of Germany, assignor to König-Electronic Friedrich W. König, Reichelsheim, Fed. Rep. of Germany

Filed Oct. 30, 1980, Ser. No. 202,058

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1979, 2931744

Int. Cl.³ G11B 5/41

U.S. Cl. 360—128 7 Claims



1. A cleaning cassette for cleaning components of a tape recorder, comprising a housing; a cleaning tape adapted for advancement within said housing; guide means positioned in said housing for supporting said cleaning tape in said advancement movement thereof; at least one dirt-removing element positioned in said housing in permanent contact with said cleaning tape so as to wipe contaminants off the same as the tape advances in the housing; and at least one guide element mounted in said housing in the vicinity of said dirt-removing element and adapted for guiding and cleaning tape in said permanent contact with a surface of said dirt-removing element, said housing being forward with at least one opening for wetting said dirt-removing element with a cleaning liquid.

4,388,664

APPARATUS FOR PROTECTING VACUUM INTERRUPTER TYPE ON-LINE TAP CHANGER

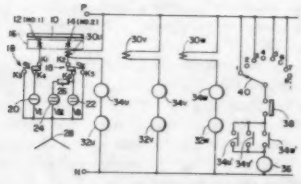
Tetsuo Watanabe, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Aug. 3, 1981, Ser. No. 289,650

Claims priority, application Japan, Aug. 4, 1980, 55-106389; Aug. 4, 1980, 55-106390

Int. Cl.³ H02P 13/06

U.S. Cl. 361—93 8 Claims



1. A vacuum interrupter type on-line tap changer comprising: a plurality of current switching elements, each of said current switching elements being coupled to a corresponding tap of a transformer through a lead wire;

a plurality of vacuum interrupters and a current limiting resistor, said vacuum interrupters and said current limiting resistor being coupled to said current switching elements so that a cross current can flow selectively through said current limiting resistor and said vacuum interrupters in accordance with contact positions of said current switching elements;

a plurality of current transformers, said current transformers being disposed to sense a current in said lead wires;

a plurality of current detecting relays and overcurrent relays, one of said current detecting relays and one of said overcurrent relays being provided for each of said current transformers, said current detecting relays and said overcurrent relays being operatively coupled to a corresponding current transformer, each of said overcurrent relays having a contact for interrupting current flowing in said transformer.

4,388,665

APPARATUS FOR REDUCING ELECTRICAL FAULT VOLTAGES IN ELECTRICAL CONDUCTORS

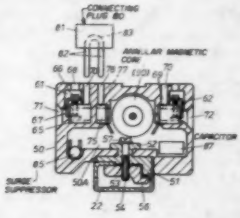
Johnny Putz, Sissach, Switzerland, assignor to Oskar Woertz, Inhaber Hans Woertz, Basel, Switzerland

Filed Aug. 20, 1980, Ser. No. 179,787

Claims priority, application Switzerland, Sep. 11, 1979, 8192/79

Int. Cl.³ H02H 3/22

U.S. Cl. 361—119 8 Claims



1. Apparatus for reducing electrical fault voltages in electric lines, comprising an insulating housing having a foot and a clamping means arranged for mounting and securing said housing on a support rail, said foot and said clamping means being electrically conductive to allow a good electrical contact with the support rail which serves as a protective ground conductor, said housing being provided with a pair of input and output connection means for external leads, at least one electric filter being disposed within said housing and including at least one series branch having input and output ends connected to said input and output connection means, respectively, and at least one shunt branch having opposite ends, respectively connected to said series branch at a point remote from the input end thereof and to said foot, and said housing further containing at least one surge suppressor having a pair of electrical terminals, one of which being connected to said input end of the series branch of said filter and the other one being connected to said foot.

4,388,666

DEMAGNETIZER FOR USE IN VEHICLES

Akira Kuno, Oobu; Muneaki Matsumoto, Okazaki, and Koji Numata, Toyokawa, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 26, 1981, Ser. No. 267,426

Claims priority, application Japan, May 28, 1980, 55-71946

Int. Cl.³ H01F 13/00

U.S. Cl. 361—149 1 Claim

1. A demagnetizer for removing residual magnetism in a vehicle comprising:

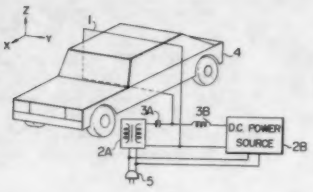
a magnetic field coil adapted to surround a portion of said vehicle from which the residual magnetism is to be removed, said magnetic coil having first and second input terminals,

a series circuit of an alternating current blocking inductor and a direct current source connected between said first and second input terminals of said magnetic field coil for supplying thereto a direct current,

a series circuit of a direct current blocking capacitor and an alternating current source connected between said first

and second input terminals of said magnetic field coil for supplying thereto an alternating current simultaneously with said direct current,

said magnetic field coil producing a direct current magnetic field and an alternating current magnetic field simultaneously, said direct current magnetic field being opposite in direction to cancel the external magnetic field, said alternating current magnetic field being effective to remove the residual magnetism in said portion of said vehicle.



4,388,667

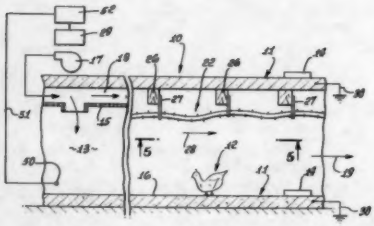
CONTROL OF STATIC NEUTRALIZATION

Donald G. Saurenman, Whittier, Calif., assignor to Consan Pacific Incorporated, Whittier, Calif.

Continuation-in-part of Ser. No. 241,684, Mar. 9, 1981, which is a continuation-in-part of Ser. No. 124,242, Feb. 25, 1980, Pat. No. 4,282,830. This application May 1, 1981, Ser. No. 259,503

Int. Cl.³ H05F 3/06

U.S. Cl. 361—231 **40 Claims**



1. The method of reducing static electricity in a work zone, that includes:

(a) providing first electrically conductive cable means with ion dispensing tips spaced therealong, and to which positive voltage is applicable,

(b) providing second electrically conductive cable means with ion dispensing tips spaced therealong, and to which negative voltage is applicable, and

(c) locating said first and second cable means at adjusted distances from the work in said zone and at adjusted separations from one another so that static electricity at or proximate the work is effectively reduced to non-objectionable levels when said positive and negative voltages are applied to the cable means,

(d) said cable means defining cables each of which is flexible and includes an elongated metallic core to which voltage is applicable, each cable including a protective sleeve of insulating material on and extending along and about the core, the sleeve defining a wall,

(e) the tips defined by needles having shanks, and inserting said shanks to penetrate through said sleeve wall and to extend sidewardly adjacent the core to make electrical contact therewith so as to receive application of said voltage, whereby the tips are openly exposed outwardly of the cable to dispense ions into the atmosphere near the cable.

4,388,668

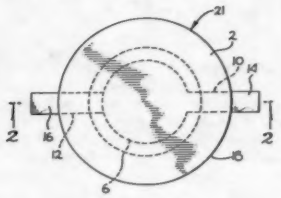
CAPACITIVE PRESSURE TRANSDUCER

Robert L. Bell, Chatsworth; Robert Willing, Anaheim, and Fred Kavli, Woodland Hills, all of Calif., assignors to Kaylico Corporation, Chatsworth, Calif.

Continuation of Ser. No. 898,469, Apr. 20, 1978, abandoned, Continuation-in-part of Ser. No. 834,498, Sep. 9, 1977, Pat. No. 4,177,496, which is a continuation of Ser. No. 666,188, Mar. 12, 1976, abandoned. This application Dec. 3, 1979, Ser. No. 99,600 The portion of the term of this patent subsequent to Dec. 4, 1996, has been disclaimed.

Int. Cl.³ H01G 7/00

U.S. Cl. 361—283 **38 Claims**



1. A pressure sensor for use over a predetermined pressure measurement range in environments subject to periodic high overload pressure comprising:

first and second ceramic insulating members having flat opposed surfaces, one of said members being relatively thin with respect to the other member and being flexible when exposed to pressure;

a thin electrically conductive plate deposited on each of said insulating members flat opposed surfaces facing one another;

means for establishing an open gap between said electrically conductive plates, said open gap ranging between 0.1 and 20 milinches, said means consisting of fused glass frit positioned around the marginal edge portion between said two members, said fused glass frit also hermetically sealing the space between said members to form a chamber;

said frit and insulative members being substantially similar materials from the standpoint of coefficient of thermal expansion; and

means including said members and said fused glass frit for permitting said electrically conductive plates to deflect toward one another without touching throughout said predetermined measurement range while allowing said plates to engage one another and bottom out under high overload pressure conditions, so that said pressure sensor is protected against impairment.

4,388,669

POLYGLYCOL DIELECTRIC CAPACITOR FLUID

Stanley W. Cichanowski, Bennington, Vt., assignor to General Electric Company, Schenectady, N.Y.

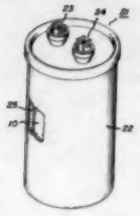
Filed Feb. 19, 1981, Ser. No. 235,810

Int. Cl.³ H01G 4/22

U.S. Cl. 361—319 **23 Claims**

1. An electrical capacitor comprising in combination, a casing, a capacitor roll section in said casing, said roll section comprising in combination, a pair of spaced apart electrodes, a solid dielectric material between said electrodes, means on said

casing to connect said electrodes to a source of power, and dielectric fluid in said casing and adjacent said electrodes and



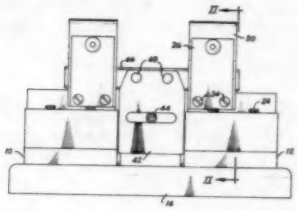
solid dielectric, said dielectric fluid comprising a polyglycol fluid having a molecular weight above about 1,000.

4,388,670

BYPASS AND METER RELEASE FOR WATTHOUR METER SOCKET

Larry E. Billhartz, Portland, Oreg., assignor to Siemens-Allis, Inc., Atlanta, Ga.

Filed May 18, 1981, Ser. No. 264,938
Int. Cl.³ H02B 9/00
U.S. Cl. 361—367 **9 Claims**



1. A meter socket assembly for releasably securing conductive blades of a watthour meter, comprising:

a pair of electrically separate lugs for receiving electrical conductors;

at least one leaf spring upstanding from each of said lugs;

a pair of conductive jaws upstanding from each of said lugs, said jaws being disposed adjacent at least one said leaf spring and including first, generally parallel portions approaching and aligned with one another to form a blade-receiving zone, and second portions more widely spaced apart than said first portions to form a zone for receiving a bypass bar;

means extending from said leaf springs to apply pressure to said conductive jaws intermediate the ends of the first, parallel portions thereof for biasing said jaws together;

bypass means for providing an electrical path between pairs of said jaws including a slide disposed between said lugs and a conductive bypass bar affixed thereto and having ends extending between ones of said pairs of jaws in said bypass-receiving zone;

said slide being movable in a direction generally parallel to said jaws for urging said conductive bypass bar between said first, generally parallel portions of said jaws in order to separate said portions;

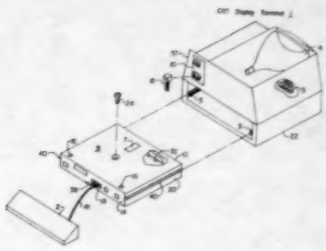
whereby a conductive path is established between pairs of said jaws and said jaws are separated sufficiently to allow conductive blades captured therebetween to be withdrawn.

4,388,671

CATHODE RAY TUBE DISPLAY TERMINAL HAVING AN ENCLOSURE FOR PROTECTION OF A LOGIC BOARD

Roger L. Hall, Nashua, N.H., and Domenic R. Romano, Chelmsford, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jun. 29, 1981, Ser. No. 278,239
Int. Cl.³ H05K 7/10, 7/20
U.S. Cl. 361—383 **7 Claims**



1. A cathode ray tube display terminal assembled with pluggable units for maintenance by customer personnel including a pluggable logic board enclosure comprising:

a logic board for mounting a plurality of logic elements having connector fingers for plugging into a fixed connector mounted to a chassis of said terminal for providing electrical connections and also including grounding fingers;

a top portion including first locating means for positioning said logic board and clearance openings for allowing said grounding fingers to project through to make electrical contact with said chassis when said enclosure is fully inserted in said terminal, thereby discharging any electrostatic charge on said logic board;

a bottom portion including second locating means for positioning said logic board;

molded-in slides for guiding said enclosure into said terminal and a molded-in snap catch which locks said enclosure in said chassis when said enclosure is fully inserted so that said connector fingers plug into said fixed connector; and

locking means for fixing the relative positions of said top portion, said bottom portion and said logic board.

4,388,672

PRINTED CIRCUIT BOARD ASSEMBLY

Richard T. Skill, Austin, Tex., assignor to Motorola Inc., Schaumburg, Ill.

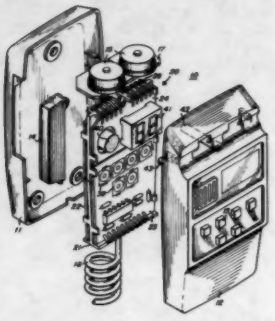
Filed May 1, 1981, Ser. No. 259,751
Int. Cl.³ H05K 1/14
U.S. Cl. 361—412 **10 Claims**

1. A circuit board assembly comprising:

at least first and second substantially planar circuit boards having conductive metallizations thereon, each of each circuit boards having a top surface and a bottom surface, some non-planar electrical components mounted on the top surface of each circuit board;

an electrically insulated circuit board carrier having raised peripheral shoulders substantially surrounding an effective planar central portion of said carrier, said first and second circuit boards mounted substantially back to back on said raised peripheral shoulders such that said bottom surfaces of said circuit boards are spaced apart from and face each other; said first and second circuit boards electrically interconnected by a plurality of jumper wire elements extending therebetween and soldered to adjacent end portions of each of said first and second circuit boards, and

wherein said circuit board carrier has a guide portion formed therein at an end of said carrier adjacent to said adjacent end portions of said first and second circuit boards, said guide portion comprising a plurality of individual spaced projections extending from said adjacent



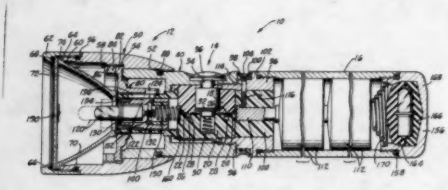
end of said circuit board carrier, said projections forming notches therebetween with each of said jumper wire elements positioned in an associated one of said notches and therefore being spaced apart by said projections, whereby a compact, inexpensive circuit board assembly is provided.

4,388,673

VARIABLE LIGHT BEAM FLASHLIGHT AND RECHARGING UNIT

Anthony Maglica, Ontario, Calif., assignor to Mag Instrument, Inc., Ontario, Calif.

Filed Jun. 22, 1981, Ser. No. 275,877
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—183 **11 Claims**



1. In combination:
a flashlight and a charger therefor;
said flashlight including a conductive strip member and a battery compartment;
conductive means extending between said strip and said compartment for establishing electrical connection between said strip and battery in said compartment for charging the battery; and
a charger including a contact member for electrically contacting the said strip; and means for connecting said contact member to a source of electrical energy.

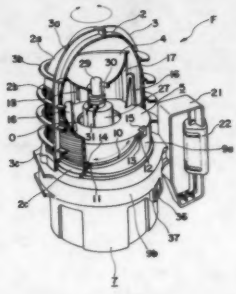
4,388,674

PORTABLE ELECTRIC FLASHLIGHT

Tadao Sano, Fukuoka, Japan, assignor to Kyushu Hitachi Maxell, Ltd., Fukuoka, Japan

Filed Mar. 31, 1981, Ser. No. 249,736
Claims priority, application Japan, Apr. 1, 1980, 55-45261[U]
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—186 **14 Claims**

1. A portable electric flashlight which comprises a battery case open at one side face for accomodating at least one electric battery therein, a hood receiving member releasably mounted on the battery case for covering the open side face of said battery case, a battery depressing plate for mounting an electric bulb to be illuminated by the at least one battery accommodated in said battery case and electrically conductive means for establishing an electrical connection between the at least one battery and said electric bulb, the battery depressing plate being held in position between said battery case and said



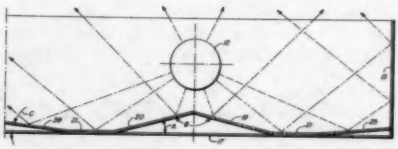
hood receiving member, and a light transmitting hood member having a front light transmitting portion and a diffused light transmitting portion at a predetermined peripheral surface portion thereof, and means for mounting the light transmitting hood member so as to enable vertical movement thereof with respect to said hood receiving member whereby light may be selectively projected through the front light transmitting portion and the diffused light transmitting portion.

4,388,675

INDIRECT LIGHTING FIXTURE

Ian Lewin, 11408 St. Andrew's Way, Scottsdale, Ariz. 85254

Filed Dec. 15, 1980, Ser. No. 216,241
Int. Cl.³ F21S *3/00*
U.S. Cl. 362—225 **6 Claims**

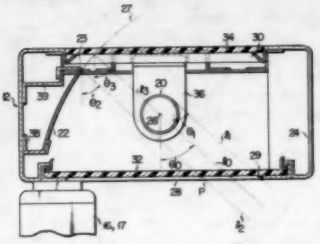


1. An indirect multiple bulb fluorescent light fixture including in combination:
an elongated rectangular housing having a base located beneath the bulbs of the light fixture;
first pairs of elongated substantially flat reflector strips arranged as first inverted V-shaped reflector member on said base located beneath each bulb, with the apex of each of said first V-shaped reflector members located in alignment with the axis of the bulb which it underlies on a line perpendicular to the plane of said base; and
a second pair of elongated substantially flat reflective strips arranged as a second inverted V-shaped reflector member located on said base between the bulbs and extending parallel thereto, the angles formed between the strips of said first and second reflector members and said base and between said reflector members and the bulbs being selected to minimize light reflected back into the bulbs from said reflector members and to cause uniform widely dispersed illumination on the ceiling above the fixture.

4,388,676
LIGHTING DEVICE

Koji Sato, Yokohama, and Tadahiro Kaneko, Tokyo, both of Japan, assignors to Toshiba Electric Equipment Corporation, Tokyo, Japan

Filed Dec. 4, 1980, Ser. No. 213,025
Claims priority, application Japan, Dec. 17, 1979, 54-163919
Int. Cl.³ F21V 13/00
U.S. Cl. 362—260 10 Claims



1. A lighting apparatus for illuminating the surface of a desk top of the type having at least a mutually parallel front edge and a rear edge, comprising:

an elongated housing which is set above the rear edge of said desk top, extending along the rear edge, and includes a light projecting opening formed therein on a side thereof facing the desk top;

a straight cylindrical light source housed in said housing so as to extend lengthwise thereof;

a reflector which has a parabolic cross section housed in said housing and positioned so as to face a backside portion of said light source wherein said light source, said housing, said reflector and said desk top are positioned such that a first vertical angle θ_0 defined by a straight line connecting an axis of said light source and the front edge of said desk top lies in a range of $45° \pm 10°$;

a second vertical angle (θ_1) defined by a straight line passing through a front end of the light-projecting opening and tangentially contacting an upper peripheral surface of said light source lies in a range of $\theta_0 \pm 10°$;

a third vertical angle (θ_2) defined by a straight line passing an upper edge of said reflector and tangentially contacting a lower peripheral surface of said light source lies in a range of $\theta_0 \pm 10°$; and

a fourth vertical angle (θ_3) defined by said reflector axis lies in a range of $\theta_0 \pm 10°$.

4,388,677
RECESSED LIGHTING UNIT

James B. Druffel, Oakland, Calif., assignor to Prescolite, A Div. of U.S. Industries, San Leandro, Calif.

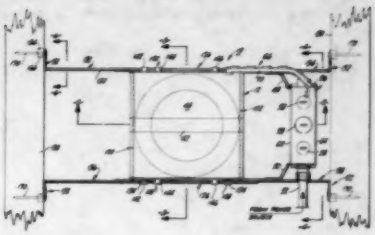
Filed Jan. 2, 1981, Ser. No. 222,042
Int. Cl.³ F21V 25/02; F21S 1/02
U.S. Cl. 362—276 9 Claims

1. A recessed lighting unit for supporting and energizing a lamp and electrical socket therefor comprising:

a. a housing having means for mounting the electrical lamp and socket thereto, and having an opening for passage of light therethrough emanating from the lamp;

b. means for providing electrical power to the electrical lamp and socket;

c. thermoprotector means for detecting heat in the vicinity of said housing and interrupting electrical power provided by said means for providing electrical power to the electrical lamp and socket upon the detection of a selected temperature by said thermoprotector means;

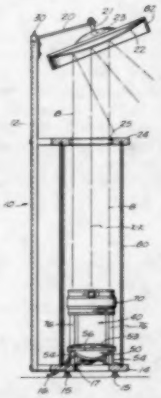


d. means for mounting said thermoprotector means adjacent and housing a selected distance from the electrical lamp and socket.

4,388,678
READING AND VIEWING LAMP

Wheeler M. Turner, 4689 Puente Plz., Santa Barbara, Calif. 93110

Filed Oct. 14, 1980, Ser. No. 196,391
Int. Cl.³ F21Y 9/00
U.S. Cl. 362—293 17 Claims



1. In apparatus for directly illuminating an area with a diverging light beam wherein written material or other objects are adapted to be directly viewed in the directly illuminated area, the combination of:

a convex mirror mounted to receive a collimated beam of light and to reflect the collimated beam of light into a diverging beam of light which is directed towards that area; and

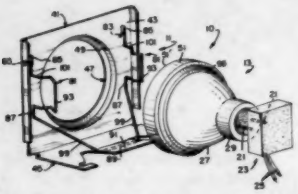
means including a source of light for directing a collimated beam of light toward said convex mirror for reflection toward that area, whereby the area is illuminated primarily by light of substantially non-crossing, diverging and unidirectional quality throughout said area.

4,388,679

PROJECTION LIGHTING UNIT WITH GLASS REFLECTOR CAPABLE OF DUAL INSERTION

Ronald G. Blaisdell, Saugus, and Harold L. Hough, Beverly, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 23, 1981, Ser. No. 237,208
Int. Cl.³ F21V *7/00, 17/06, 21/00;* **G03B** *15/02*
U.S. Cl. 362—306 **21 Claims**



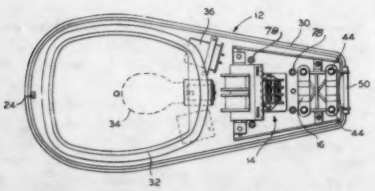
1. In a projection lighting unit including a lampholder assembly, a glass reflector removably positioned within said lampholder assembly and including a forward, concave reflecting portion and a rear neck portion, and a projection lamp positioned within said glass reflector, said lampholder assembly including a bracket member having a substantially planar faceplate portion with an aperture therein and a base portion extending therefrom and means for engaging said glass reflector at an external surface thereof to retain said reflector in a predetermined manner of alignment within said lampholder assembly relative to said aperture within said substantially planar faceplate portion of said bracket, the improvement wherein said means for engaging said glass reflector at an external surface thereof to retain said reflector within said lampholder assembly in said predetermined manner of alignment comprises a pair of deflectable engagement members secured to said faceplate portion of said bracket member on opposing sides of said aperture, each of said engagement members occupying a first, closed position prior to insertion of said glass reflector having said projection lamp therein within said lampholder assembly and deflecting to a second, open position during said insertion such that said glass reflector is insertable and removable within said lampholder in two directions, the first of said directions being substantially parallel to said substantially planar faceplate portion of said bracket, and the second of said directions being substantially perpendicular to said substantially planar faceplate portion, said deflectable engagement members substantially returning to said first, closed position when said glass reflector is fully positioned within said lampholder assembly.

4,388,680

LUMINAIRE FOR ROADWAY LIGHTING

William C. Moore, Memphis, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,135
Int. Cl.³ B60Q *1/00*
U.S. Cl. 362—368 **5 Claims**



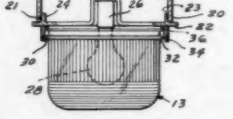
1. An outdoor luminaire comprising an upper and a lower housing joined to enclose a central cavity having an illuminating lamp on an essentially horizontal axis with said luminaire adapted for mounting on a substantially horizontal axis, cylindrical mast; said upper and lower housings being fabricated of plastic material; a load bearing insert of greater tensile strength than the plastic material of said housings extending within said cavity from a mounting to said mast adjacent one end of said luminaire to the insert termination intermediately within the luminaire; said insert having an arcuate outer wall closely conforming to the shape of a section of the inner wall of said upper housing adjacent thereto with the inner wall of the upper housing adapted to rest on the outer wall of the insert; said insert including a concave inner wall with a plurality of transverse reinforcing ribs and means for securing on said insert components of said luminaire, a plurality of embosses in the inner wall of the upper housing for receiving bolts for securing the insert to rest on said upper housing, a reflector within said housing affixed to the upper housing to reflect light generated by said lamp with said insert termination spaced and externally from the reflector.

4,388,681

HAZARDOUS LOCATION LIGHT FIXTURE

E. Robert Meyer, Packanack Lake, N.J., assignor to Keene Corporation, Union, N.J.

Filed Dec. 15, 1980, Ser. No. 216,564
Int. Cl.³ F21V *17/00*
U.S. Cl. 362—374 **4 Claims**



1. An explosion-resistant fixture comprising: a ballast compartment containing therein the electrical components for the fixture; a lamp housing containing a lamp socket mounted to said ballast compartment; and filling means filling all voids in said ballast compartment.

4,388,682

MICROPROGRAMMABLE INSTRUCTION TRANSLATOR

David P. Eldridge, Acton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 4, 1979, Ser. No. 71,911
Int. Cl.³ G06F *9/20*
U.S. Cl. 364—200 **8 Claims**

1. In combination:

an instruction register for sequentially storing digital instructions during execution in a digital processor, each of said digital instructions corresponding to a sequence of microinstructions to be executed;

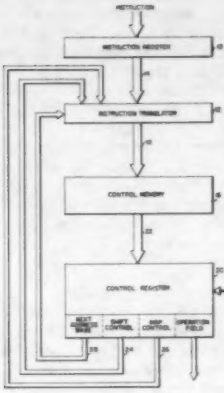
an addressable memory for storing digital microinstructions constituting said sequences of microinstructions;

a microinstruction register connected to the output of said addressable memory for sequentially storing said digital microinstructions after being read out of said memory and during execution;

means coupled to said instruction and microinstruction registers for providing digital addresses to said addressable memory for reading said sequences of microinstructions out of said memory and sequentially into said microinstruction register for execution;

said providing means comprising means for selecting a contiguous set of bits from the digital instruction resident in

said instruction register for inclusion in one of said digital addresses wherein the number of bits in said selected set is determined by a first field of bits of the microinstruction resident in said microinstruction register and wherein the position in said resident instruction from which said set is



selected is determined by a second field of bits of said resident microinstruction; and

said providing means further comprising means for selecting bits from a third bit field of said resident microinstruction for inclusion in said one digital address.

4,388,683

DATA TRANSMISSION/RECEIVING DEVICE HAVING PARALLEL/SERIAL AND SERIAL PARALLEL CHARACTER CONVERSION, PARTICULARLY FOR DATA EXCHANGE BETWEEN COMMUNICATING DATA PROCESSING SYSTEMS

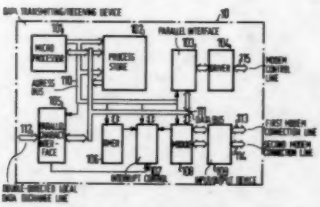
Wolfgang Beifuss; Paul Birzele, and Gerhard Geitz, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 27, 1980, Ser. No. 134,482

Claims priority, application Fed. Rep. of Germany, May 23, 1979, 2920994

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **9 Claims**



1. In a data transmitting/receiving device of the type having parallel/serial and serial/parallel character conversion and connected via a data transmission line to a local data processing system and connected to a data modem terminating a data communication line for controlling the transmitting and receiving procedures, in which an address bus and a data bus are provided, and in which a procedure memory and a random access memory as a data buffer are connected to the address bus and to the data bus for intercepting data jams, and which includes an interrupt control connected to the address bus and to the data bus for interrupting processing operations of a microprocessor means which is also connected to the address bus and to the data bus in response to processing operations of a higher priority, and in which a timer is connected to the address bus and to the data bus and is operable to set the data transmission speed, the improvement therein comprising:

first and second modem connection lines;

first means in the microprocessor means responsive to corresponding input switching commands to convert data messages into a correspondingly-selected bit or character orientation; and

second means connected to said first and second modem connection lines and to said first means and operable to transmit data selectively in accordance with the synchronous data link control method and the high-level data link control method over a selected modem connection line.

4,388,684

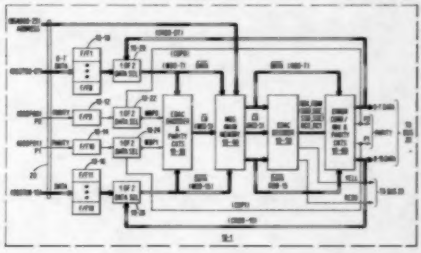
APPARATUS FOR DEFERRING ERROR DETECTION OF MULTIBYTE PARITY ENCODED DATA RECEIVED FROM A PLURALITY OF INPUT/OUTPUT DATA SOURCES

Chester M. Nibby, Jr., Peabody, and Robert B. Johnson, Billerica, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Mar. 27, 1981, Ser. No. 248,107

Int. Cl.³ G06F *11/10*

U.S. Cl. 364—200 **36 Claims**



1. A data processing system including a plurality of data handling devices, each connected in common to receive and transfer words including a plurality of bytes over a bus network, said system further including a memory subsystem comprising:

a memory for storing said words;

input means coupled to said bus for receiving one of said words from any one of said data handling devices for storage in said memory during a memory cycle of operation, each said word including a plurality of bytes and a plurality of parity bit signals each or indicating the validity of a different one of said bytes;

encoder means coupled to said input means and to said memory, said encoder means for generating a group of coded check bits derived from said plurality of said bytes and said plurality of parity bit signals, said encoder means forcing a predetermined number of said coded check bits to predetermined states when said plurality of parity bit signals indicate that said bytes are in error;

means connected to said encoder means and to said input means for applying said bytes and group of coded check bits to said memory for said storage during said memory cycle of operation; and,

decoder means coupled to said memory, said decoder means for generating a plurality of syndrome signals for locating an error in said bytes, the location of said error being established by said bytes and said coded check bits read out from said memory during a subsequent cycle of operation, said plurality of syndrome signals having a first

predetermined characteristic for signalling when said plurality of bytes of a word received from any one of said data handling devices have incorrect parity when written into said memory enabling the detection of multibyte parity errors in said words to be deferred until accessed by one of said devices so as to have a minimum effect on system performance.

4,388,685

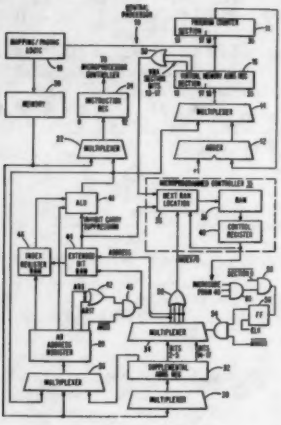
CENTRAL PROCESSOR WITH APPARATUS FOR EXTENDED VIRTUAL ADDRESSING

Alan Kotok, Harvard; Daniel L. Murphy, Framingham, and Robert E. Stewart, Stow, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 931,059, Aug. 4, 1978. This application Jun. 26, 1980, Ser. No. 163,097

Int. Cl.³ G06F *9/36*

U.S. Cl. 364—200 **8 Claims**



1. A central processing means for processing instructions, indirect words and operands stored in a memory means having a plurality of storage locations specified by virtual memory addresses wherein the memory means is partitioned into a plurality of sections, each of the instructions and indirect words having a memory address field and an address type field, the memory address field in each instruction defining a number of locations corresponding to the number of locations in one memory section and each indirect word having a format field that defines first and second sets of bit positions in the addressing and address type fields, the number of addressing field bit positions in the first and second sets uniquely defining a location in either one specific section of the memory means and in any section of the memory means, respectively, said central processing means comprising:

A. first storage means for the memory address field and the address type field,

B. second storage means for storing an address that uniquely defines a location in the memory means,

C. address generating means connected to said first and second storage means for generating an effective address in response to the address type field and the memory address field in an instruction during at least one iteration, said address generating means including:

i. means responsive to the contents of the memory address field in said first storage means for storing in said second storage means an intermediate address,

ii. field control means connected to said first storage means for establishing, during each iteration and in response to indirect and direct states defined by the address type field, whether the contents of the second storage means constitute, respectively, the address of an indirect word or the effective address,

iii. transfer means connected to said second storage means and said field control means for transferring, for each iteration that occurs during an indirect state, an indirect word to said first storage means from the location specified by the contents of said second storage means,

iv. selection means connected to said first storage means for selecting, during each iteration, the memory address field and the address type field from the corresponding sets of locations in the indirect word in response to the contents of a format field of the indirect word in said first storage means, and

v. controller means connected to said field control means and said selection means for terminating further iterations of said address generating means when the address type field in said first storage means defines the direct state thereby to indicate that said second storage means contains the effective address.

4,388,686

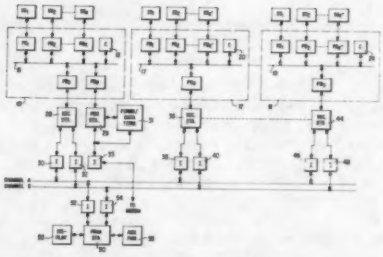
COMMUNICATION SYSTEM FOR DISTRIBUTED CONTROL ARRANGEMENT

William R. Haid, Hamilton, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Oct. 20, 1980, Ser. No. 198,901

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **26 Claims**



1. In a communication system for a distributed control arrangement adapted to control the operation of a plurality of operating units of a common installation, each of said operating units being under the control of a set of subsystems adapted to perform specific control functions relative to the corresponding operating unit;

a plurality of communication nodes each corresponding to a separate one of said operating units, each of said nodes being coupled to the set of subsystems that exercise control over the corresponding operating unit;

a separate secondary station coupled to each of said nodes;

each of said nodes including a common node bus;

the secondary station and respective ones of the set of subsystems associated with a node individually constituting separate circuits external to said node, each of said external circuits including a local data processor and being adapted to communicate through said node bus;

a data link interconnecting respective nodes through the secondary station associated with each node; and

a primary station coupled to said data link and including a data processor, said primary station being adapted to address respective ones of said secondary stations through said data link in accordance with a predetermined protocol and a sequence determined by said primary station;

whereby said primary station upon its own command is capable of communicating with respective ones of a selectively variable number of nodes coupled to said data link to transmit or receive information with respect to selected subsystems associated with each of said nodes, said pri-

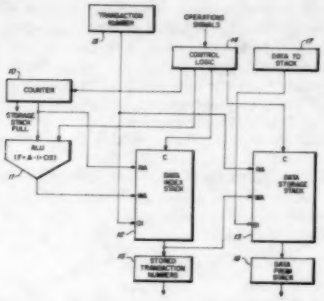
mary station being adapted to prevent contention between competing nodes for access to said data link.

4,388,687

MEMORY UNIT

Jerome J. Twibell, and Robert J. Johnston, both of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jan. 5, 1981, Ser. No. 222,462
Int. Cl.³ G06F 9/06
U.S. Cl. 364—200 **12 Claims**



1. In association with a data processing system, a memory unit for temporary storage of data signal groups comprising:

a first group of storage locations for storing said data signal groups,

a second group of storage locations coupled to said first group of storage locations, each storage location of said second group of storage locations storing an address value corresponding to a storage location of said first group of storage locations;

counter means for addressing said second group of storage locations; and

control apparatus generating control signal sets for said memory unit in response to signals from said data processing system, wherein a first control signal set causes a first data signal group from said data processing system to be entered in a first storage location of said first group of storage locations, said first storage location being identified by a first address value stored in a first location of said second group of storage locations, said first location of said second group of storage locations being identified by a first counter value contained in said counter means, said first address value stored in said first location of said second group of storage locations being coupled to said data processing system, and wherein a second control signal set causes a second data signal group stored in a second location of said first group of storage locations to be coupled to said data processing system by a second address value coupled by said data processing system to said first group of storage locations, said second address value coupled by said data processing system being stored concurrently in a second location of said second group of storage locations, said second location being determined by a second counter value of said counter means.

4,388,688

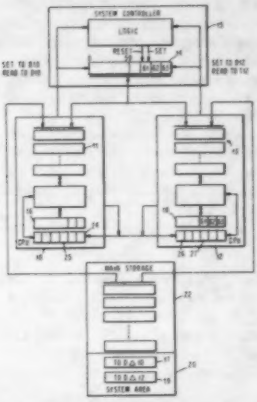
SHARED TOD CLOCK MODIFICATION BIT

Thomas O. Curlee, III, and Ethel L. Richardson, both of Poughkeepsie, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 10, 1981, Ser. No. 320,153
Int. Cl.³ G06F 11/00
U.S. Cl. 364—200 **2 Claims**

1. In a computer which has a TOD clock count maintained in a register that is shared by at least two processors where each processor implements a timer function by subtracting a stored count from a count of the TOD clock register and where at least one processor is capable of changing the TOD count in the register by instruction and at the completion of the instruction updating the stored counts for the processor, a method for correcting errors introduced into the timer calculations of the other processor by a concurrently occurring change in the TOD clock count made by said one processor;

storing one type of binary manifestation as a status signal in



said register along with the TOD count each time the TOD clock is changed by said one processor which is changing the TOD count;

supplying said one type of binary manifestation to said other processor only the first time it interrogates said register after said register has been modified by said first processor;

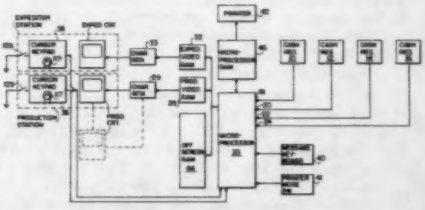
modifying the first occurring timer calculation of said other processor by a stored difference signal which reflects the magnitude of any error which exists in the timer calculation as a result of said changing of the TOD clock count.

4,388,689

RESTAURANT VIDEO DISPLAY SYSTEM

Richard W. Hayman; Burton Goldstein, both of Potomac; Joe J. Lynn, Gaithersburg; Robert J. Brown, Columbia, and Robert S. Bugash, Wheaton, all of Md., assignors to OCR Marketing Associates, Inc., Washington, D.C.

Filed Jan. 28, 1981, Ser. No. 229,034
Int. Cl.³ G06F 15/20
U.S. Cl. 364—401 **13 Claims**



9. In a video display system comprising:

a plurality of item data entry means, connected to an input of data computing means, for entering individual items of an item group;

a plurality of production CRTs connected in circuit with the output of the computing means for displaying the entered

items, each item assigned a symbol corresponding to a work station whereat the item is prepared;

cursor control means located at the work station and connected in circuit with the computing means for marking an item upon completion of its preparation by selective cursor placement;

the computing means determining when preparation of all entered items of a group have beem completed and thereafter erasing such displayed items from the CRT;

an expediting CRT connected in circuit with the computing means for displaying the items of each group as the preparation of each group has been completed;

printing means connected to the output of the computing means for printing selected data entered into the computing means;

a keyboard connected to an input of the computing means for entering a message therein which is displayed on the expediting CRT; and

a second cursor control means located at an expediter station and connected in circuit with the computing means for positioning the cursor at the last item of a group displayed on the expediting CRT, causing the erasing of the group displayed thereon.

4,388,690

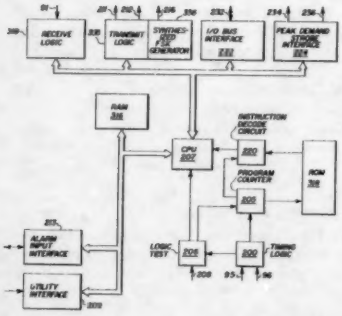
AUTOMATIC METER READING TRANSPONDER

James R. Lumsden, Edmonton, Canada, assignor to AEL Microtel Limited, Burnaby, Canada

Continuation-in-part of Ser. No. 83,990, Oct. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 881,791, Feb. 27, 1978, abandoned. This application Oct. 21, 1980, Ser. No. 199,389

Int. Cl.³ H04Q *9/00*; G01R *11/64*

U.S. Cl. 364—483 **16 Claims**



1. A transponder unit for use with a non-dedicated communication link comprising:

receiver means for receiving external instruction signals from said communication link;

transmitter means for transmitting data via said communication link;

a central processing unit (CPU) connected to said receiver means and said transmitter means;

a clock generator means for controlling said CPU;

a read only memory (ROM) connected to said CPU, said ROM containing a program for controlling said CPU;

a real time clock connected to said CPU for determining sequential predetermined time periods;

three input terminals connected to said CPU for receiving data to be stored in a random access memory (RAM), one of said three input terminals having pulses impressed thereon, the number of said pulses being representative of a utility consumption, said one of said three input terminals also being connected, via said CPU, to a time-of-day memory, said time-of-day memory being comprised of a plurality of discretely addressable registers, wherein said CPU correlates each addressable register sequentially with a consecutive one of said predetermined time periods, so that each register sequentially contains a count which is representative of consumption during its associated time period or any fraction thereof; wherein, upon receipt of one of said external instruction signals, said CPU activates said transmitter means to transmit data, said data being, in part, the contents of each register in said time-of-day meory transmitted in sequence; wherein one of said external instruction signals is an initialization signal which sets said real time clock, wherein initialization of said time-of-day memory can take place at any time during one of said predetermined time periods, wherein a first address of said time-of-day memory contains a count representing the fraction of a time period remaining after initialization, a second address contains a count representing consumption in said fraction of a time period, each subsequent address containing a count representing consumption in each subsequent time period, respectively;

said unit further comprising identification code word means connected to said CPU for setting an identification code word into said RAM, wherein said CPU provides comparator means which compares another of said external instruction signals with said identification code word, a positive comparison validating that the correct transponder unit has been selected.

4,388,691

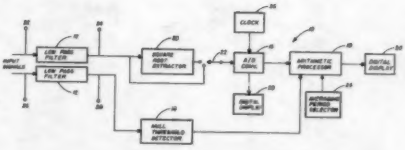
VELOCITY PRESSURE AVERAGING SYSTEM

Steven P. Nuspl, Barberton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 23, 1981, Ser. No. 227,864

Int. Cl.³ G06F *7/38*

U.S. Cl. 364—510 **11 Claims**



1. Apparatus for measuring the velocity pressure of a flowing gas or air stream comprising means for sampling measurements of the velocity pressure of said stream, means for averaging said sampled measurements of said velocity pressure to determine an average value of said velocity pressure measurements, and means for detecting the static pressure differential at the point in the said stream at which said velocity pressure measurements are being taken, said detecting means permitting said velocity pressure measurements to be transmitted to said averaging means only when said static pressure differential is detected to be within a predetermined range.

4,388,692

ELECTRONICALLY CONTROLLED PROGRAMMABLE DIGITAL THERMOSTAT HAVING VARIABLE THRESHOLD HYSTERESIS WITH TIME

James J. Jones, Elizabethton, and John O. McIntosh, Johnson City, both of Tenn., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 3, 1980, Ser. No. 183,703

Int. Cl.³ G05D *23/32*

U.S. Cl. 364—557 **17 Claims**

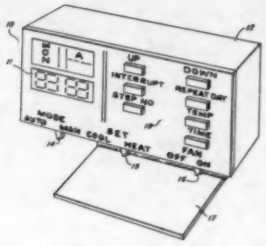
1. A thermostat system for controlling heating and cooling systems supplying an indoor area to maintain desired ambient temperatures during selected time periods in said area, said thermostat system comprising;

(a) temperature sensing means including at least one temper-

ature sensor for sensing the ambient temperature of said area and for providing a digital signal indicative thereof;

(b) means for generating time signals;

(c) digital circuit means having a plurality of input and output terminals, said digital circuit means being coupled to said time signal means and said temperature sensing means for receiving said time signals and for monitoring said ambient temperature, said digital circuit means including logic circuitry for storing digital coded information entered therein while said information is being processed, said digital circuit means being responsive to real time and ambient temperature and to said digital coded information for controlling the heating and cooling systems in accordance with an electronic threshold hysteresis



temperature which is variable with time in discrete steps around said desired ambient temperature, said discrete steps successively approaching the ambient temperature;

(d) data entry means coupled to said digital circuit means for entering said digital coded information into said digital circuit means;

(e) display means for displaying desired parameters of time and temperature including information entered from said data entry means; and

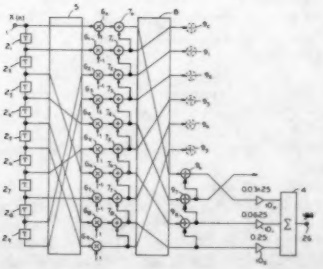
(f) electrically controllable switch means coupled to at least one of said output terminals for selectively activating and deactivating said heating and cooling systems in accordance with a signal from said digital processor means derived from a comparison of the ambient temperature with the electronic threshold hysteresis temperature.

4,388,693

NON-RECURSIVE DIGITAL FILTER

Kenji Nakayama, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1980, Ser. No. 221,808
Claims priority, application Japan, Jan. 7, 1980, 55-404
Int. Cl.³ G06F *15/31*
U.S. Cl. 364—724 **4 Claims**



1. A non-recursive digital filter having predetermined N filter coefficients h_i(i=0 to N−1) to perform

$$y(n) = \sum_{i=0}^{N-1} h_i x(n-i) = \sum_{j=0}^{N-1} sign(h_j) h^*_j x^*(n-j) =$$

$$\sum_{j=0}^{N-1} h^*_j \tilde{x}^*(n-j) = \sum_{j=0}^{N-1} \Delta_j u(n-j)$$

in response to a sequence x(n−i) of N consecutive binary coded words, where h^*_j represent the coefficients of the absolute values of h_i arranged in the order of magnitude; $x^*(n-j)$ represent $x(n-i)$ corresponding to h^*_j; sign (h_j) represent the polarities of h_i; Δ_j represent differences between adjoining coefficients h^*_j; $\tilde{x}^*(n-j)$ represent the products of sign (h_j) and $x^*(n-j)$; and

$$u(n-j) = \sum_{k=j}^{N-1} \tilde{x}^*(n-k),$$

said filter comprising:

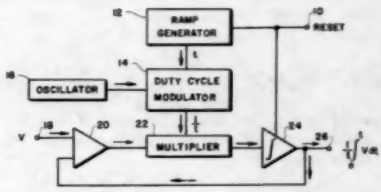
arranging means for arranging said sequence x(n−i) corresponding to the coefficients h^*_j to obtain $x^*(n-j)$; first means for obtaining the product of each of the outputs $x^*(n-j)$ given from the arranging means and the corresponding polarity of each of the coefficients h_i; second means for accumulating the outputs $\tilde{x}^*(n-j)$ given from said first means to obtain u(n−j); coefficient generating means for producing said differences Δ_j; third means for multiplying the outputs u(n−j) supplied from said second means by said differences Δ_j; and fourth means for accumulating outputs $\Delta_j u(n-j)$ given from said third means.

4,388,694

CIRCUITRY FOR SIMULTANEOUSLY PERFORMING INTEGRATION AND DIVISION

Robert S. Loveland, West Covina, Calif., assignor to The Perkin-Elmer Corp., Norwalk, Conn.

Filed Apr. 16, 1981, Ser. No. 254,803
Int. Cl.³ G06G *7/18, 7/16*
U.S. Cl. 364—834 **6 Claims**



1. A circuitry for integrating with respect to time a signal representing an analog quantity while simultaneously dividing the integral by time, said circuitry comprising:

first circuitry means responsive to a first input signal for generating an output voltage having an amplitude proportional to the time duration of said input signal;

second circuitry means coupled to said first circuitry means and responsive to said output voltage for generating a cyclic output signal with high-to-low levels inversely proportional to the time duration of said first input signal;

an amplifier for receiving and amplifying a voltage signal representing the analog quantity to be integrated;

multiplier circuitry coupled to said amplifier and to said second circuitry means for multiplying the amplified analog voltage signal by said cyclic output signal;

and

integrating circuitry coupled to said multiplier circuitry for integrating the product of said analog voltage signal and said cyclic output signal to produce an output signal of

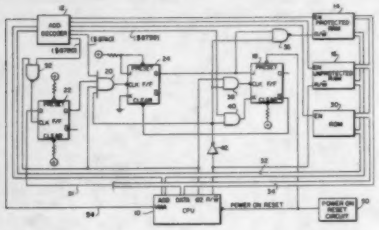
$1/t\int V\,dt$, wherein "V" is the analog voltage signal and "t" is the time duration of said first input signal.

4,388,695

HARDWARE MEMORY WRITE LOCK CIRCUIT

Joseph B. Heinemann, New York, N.Y., assignor to Timeplex, Inc., Rochelle Park, N.J.

Filed Feb. 21, 1980, Ser. No. 123,368
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—900 **21 Claims**



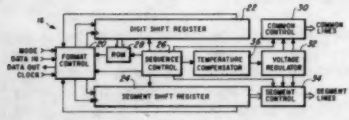
1. A memory protect system for a read/write memory having an area containing critical data which is to be protected; said memory having extended thereto, and being included in an overall system which has, address and data buses, and control means for accessing said memory; comprising hardware means responsive to and for registering the occurrence of at least one predetermined access cycle in which a predetermined unlocking address appears on said address bus; hardware means for locking said critical data memory area by preventing write operations in the absence of the prior registering of the occurrence of said at least one predetermined access cycle in which said predetermined unlocking address appears on said address bus; and hardware means for unlocking said critical data memory area by allowing write operations only for a predetermined number of other access cycles which are subsequent to the registering of the occurrence of said at least one predetermined access cycle, each of such allowed write operations being at an address different from said predetermined address.

4,388,696

DATA PROCESSING SYSTEM HAVING DUAL OUTPUT MODES

Howard R. Test, II, Lubbock, Tex., and Michael J. Drury, Ft. Collins, Colo., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 14, 1980, Ser. No. 168,853
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—900 **7 Claims**



1. A data processing system comprising

data processing means for producing data in an encoded format and a display format when operating in a first and second mode, respectively, and a mode signal indicative of said first and second mode,

display driver means coupled to said data and said mode signals, said display driver means converting said encoded format to a display format when said first mode signal is present or transmitting said display format when said second mode signal is present, and

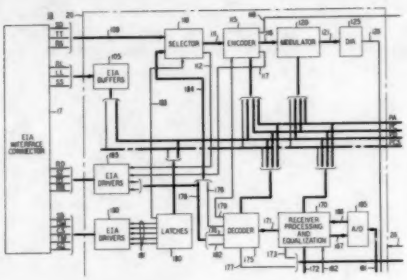
display means coupled to said display driver means for displaying said display format data.

4,388,697

VOICEBAND DATA SET CIRCUITRY WITH DUAL BUS ARCHITECTURE

Robert N. Breen, Lanoka Harbor, and Henry R. Goldenberg, Howell, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 8, 1980, Ser. No. 184,929
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **25 Claims**



1. Signal processing apparatus comprised of

a plurality of registers, and

a first bus (PD) common to said registers,

characterized by

a second bus (LEB or LDB),

a plurality of circuit means each operative for processing a signal received from said second bus in accordance with a respective selected one of a predetermined plurality of formats and for returning the processed signal to said second bus,

local controller means for operating said circuit means in a selected sequence, and

second controller means for writing information signals into ones of said registers via said first bus, ones of said information signals identifying respective ones of the selected formats.

4,388,698

DATA BUFFER CIRCUIT

John H. Allen, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 22, 1981, Ser. No. 276,277
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—900 **12 Claims**

1. A data storage circuit comprising, in combination:

a first input terminal to receive a data ready pulse signal;

first gating means having a first input effectively connected to said first input terminal, a second input, and first, second, and third outputs, for providing, in response to said data ready pulse signal, a first latch signal, a second latch signal, and a third latch signal;

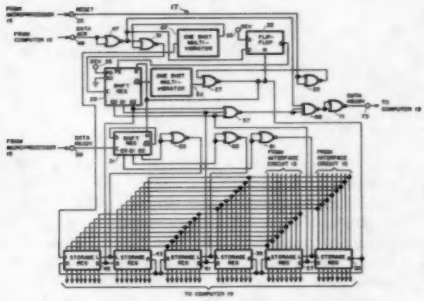
a second input terminal to receive a data acknowledge pulse signal;

a third input terminal;

second gating means having a first input effectively connected to said second input terminal, a second input, a third input effectively connected to said third input terminal, a first output connected to the second input of said first gating means, and second, third, fourth, and fifth outputs, for providing, in response to said data acknowledge pulse signal, a first select signal, a second select signal, and a third select signal;

first storage means having a latch input connected to the first output of said first gating means, a select input connected to the second output of said second gating means, a reset input connected to the first output of said second gating means, a plurality of data inputs, and a plurality of data outputs, adapted for receiving at the data inputs thereof a first data word, for storing therein for a first predetermined time period, in response to said first latch signal, said first data word, and for transferring to the data outputs thereof, in response to said first select signal, said first data word;

second storage means having a latch input connected to the second output of said first gating means, a select input connected to the third output of said second gating means, a reset input connected to the first output of said second gating means, a plurality of data inputs, and a plurality of data outputs, for receiving at the data inputs thereof a



second data word, for storing therein for a second predetermined time period, in response to said second latch signal, said second data word, and for transferring to the data outputs thereof, in response to said second select signal, said second data word; and

third storage means having a latch input connected to the third output of said first gating means, a select input connected to the fourth output of said second gating means, a reset input connected to the first output of said second gating means, an interrupt output connected to the second input of said second gating means, a plurality of data inputs, and a plurality of data outputs, for receiving at the data inputs thereof a third data word, for storing therein for a third predetermined time period, in response to said third latch signal, said third data word, and for transferring to the data outputs thereof, in response to said third select signal, said third data word.

4,388,699

BUBBLE MEMORY SENSE AMPLIFIER

Ramanatha V. Balakrishnan, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 19, 1981, Ser. No. 225,876

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—8 **5 Claims**

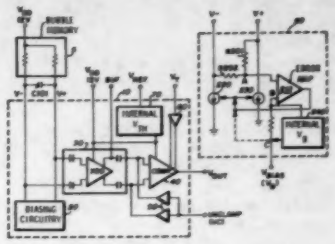
1. A circuit for biasing differential first and second inputs comprising:

current source means coupled to the first and second magneto-resistive detectors and having a control input for providing one current to the first magneto-resistive detector having an amplitude responsive to the amplitude of a signal applied to the control input and for providing another current to the second magneto-resistive detector having an amplitude substantially identical to the one current;

a first resistor having a first terminal coupled to the first magneto-resistive detector and having a second terminal;

a second resistor having a first terminal coupled to the second magneto-resistive detector and having a second terminal coupled to the second terminal of the first resistor; and

a differential amplifier having first input coupled to the second terminals of the first and second resistors, a second input,



and an output coupled to the control input of the current source means for providing a signal to the control input having an amplitude responsive to the difference between the amplitudes of the signals applied to the first and second inputs of the differential amplifier.

4,388,700

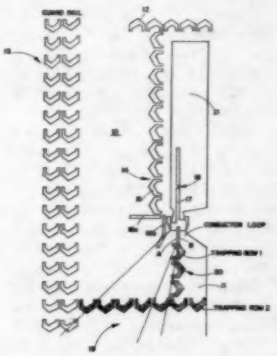
NUCLEATION BUBBLE GENERATOR FOR BUBBLE DOMAIN DEVICES

Laszlo V. Gal, West Covina, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 2, 1981, Ser. No. 239,235

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—11 **4 Claims**



1. A magnetic bubble domain device comprising:

a layer of material in which magnetic bubble domains can be moved;

a bubble domain generation means coupled to said layer and defining a nucleation source for magnetic bubble domains in said layer, said generated bubble domains along with possibly unwanted duplicate bubble domains being produced in response to a current pulse;

a first bubble domain guide structure coupled to said layer and disposed directly adjacent said generation means and defining a first bubble domain propagation path for guiding the movement of said generated bubble domains in said layer in response to a cyclical change in orientation or a reorientating field within the place of said layer, said first guide structure functioning to receive said bubble domains representative of information which are generated by said generation means;

characterized in that said device further comprises a second bubble domain guide structure coupled to said layer and

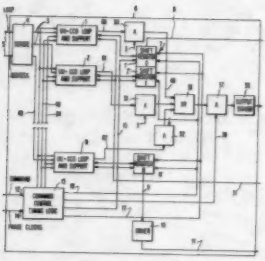
disposed directly adjacent said generation means and said first bubble domain guide structure, said second bubble domain guide structure being operative for receiving and guiding the movement of said unwanted duplicate bubble domains produced in said layer by said generation means simultaneously with the production of ones of said generated bubble domains representative of information and transferred to said first bubble domain guide structure.

4,388,701

RECIRCULATING LOOP MEMORY ARRAY HAVING A SHIFT REGISTER BUFFER FOR PARALLEL FETCHING AND STORING

Frederick J. Aichelmann, Jr., and Fernando Neves, both of Hopewell Junction, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 30, 1980, Ser. No. 192,581
Int. Cl.³ G11C *7/00, 8/00*
U.S. Cl. 365—77 **6 Claims**



1. A memory array comprising,
a plurality of recirculating loop memory elements,
said elements being clocked in synchronism so that the corresponding bits recirculate in their respective loops with the same time phase,
a shift register having a serial data input and a serial data output and comprising a number of cells equal in number to the number of said elements
a data input line coupled to said input,
a data output line coupled to said output,
first means for selectively connecting each said coil to a respective one of said elements for writing data from said cells into said elements,
second means for selectively connecting each said cell to a respective one of said elements for reading data from said elements into said cells, and
means for shifting data stored in said shift register throughout said number of cells in the time interval between successive clockings of said elements.

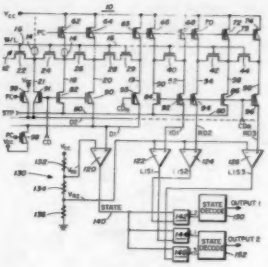
4,388,702

MULTI-BIT READ ONLY MEMORY CIRCUIT

Douglas P. Sheppard, Grapevine, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Aug. 21, 1981, Ser. No. 294,831
Int. Cl.³ G11C *17/00*
U.S. Cl. 365—104 **22 Claims**

1. A read only memory (ROM) circuit, comprising:
a word line;
a plurality of storage transistors having the control terminals thereof connected to said word line, each of said storage transistors having one of a plurality of threshold voltages wherein said threshold voltages correspond to respective predetermined data states;
a plurality of reference transistors having the control terminals thereof connected to said word line, each of said reference transistors having one of said threshold voltages;
means for driving each of said transistors to an initial condition;
means for generating a control signal which is applied to each of said transistors for sequentially driving a plurality of said transistors from said initial condition to a final condition in an order corresponding to the threshold voltages of said transistors;



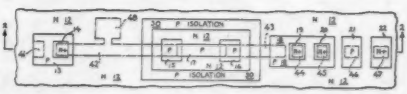
means for determining the condition, initial or final, of said reference transistors when a selected one of said storage transistors is driven from said initial condition to said final condition; and
means for decoding the condition, initial or final, determined for said reference transistors when said selected storage transistor is driven to said final condition to generate an output signal corresponding to the data state of said selected storage transistor.

4,388,703

MEMORY DEVICE

Richard J. Patch, and George D. Rose, Jr., both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Continuation-in-part of Ser. No. 37770, May 10, 1979, abandoned. This application Aug. 26, 1980, Ser. No. 181,423
Int. Cl.³ G11C *11/40, 17/06*
U.S. Cl. 365—105 **12 Claims**

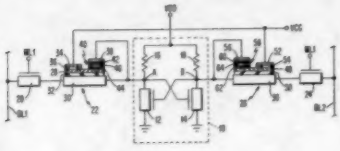


1. A monolithic integrated circuit comprising a plurality of logic devices each comprising an input, a plurality of programmable circuits each comprising a resistor and a diode device and adapted to be programmed in response to application of programming signals, said logic devices normally being adversely affected by the application of programming signals, each of said resistors coupling a selected one of said logic device inputs through a respective, associated diode device to a common reference point, each of said diode devices initially exhibiting a high impedance, means for modifying said logic devices comprising means for applying programming signals to the junctions between selected ones of said resistors and their associated diode devices to cause said last named diode devices to irreversibly exhibit a bidirectional low impedance which establishes the associated reference states at said last names junctions, said resistors being dimensioned to block such adverse programming signal effects on said logic elements by said first means.

4,388,704
NON-VOLATILE RAM CELL WITH ENHANCED CONDUCTION INSULATORS

Claude L. Bertin, South Burlington; Harish N. Kotecha, Essex Junction, and Francis W. Wiedman, Stowe, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1980, Ser. No. 192,579
Int. Cl.³ G11C 11/40
U.S. Cl. 365—154 17 Claims

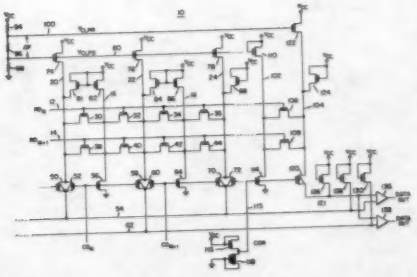


1. A memory system comprising;
a semiconductor substrate,
a volatile memory cell having a data node formed in said substrate,
a non-volatile device including:
a floating gate capacitively coupled to said substrate,
a first control gate,
a thin insulating layer disposed between said floating gate and said first control gate,
a second control gate, and
a dual charge injector structure disposed between said floating gate and said second control gate,
means for coupling one of said control gates of said non-volatile device to said data node, and
means for applying control pulses to the other of said control gates of said non-volatile device for selectively transferring data between said data node and said floating gate.

4,388,705
SEMICONDUCTOR MEMORY CIRCUIT

Douglas P. Sheppard, Grapevine, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Oct. 1, 1981, Ser. No. 307,641
Int. Cl.³ G11C 7/00, 17/00
U.S. Cl. 365—210 7 Claims

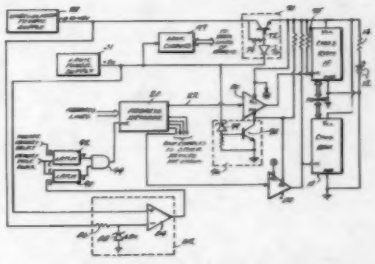


1. A semiconductor memory circuit comprising:
a plurality of word lines which are selectively activated in response to an address signal;
a plurality of memory cell bit lines;
a plurality of memory cells each connected to one of said word lines for activation thereby and connected to one of said memory cell bit lines for data transfer therethrough;
a data line;
means responsive to an address signal for selectively connecting one of said memory cell bit lines to said data line;
a reference bit line;
a plurality of reference cells connected respectively to said word lines for activation thereby said reference cells connected to provide a reference signal at said reference bit line, said reference signal having a static state when one of said reference cells is activated for a time period greater than the discharge time of said reference bit line and said reference signal having a dynamic state when said reference cells are accessed at a rate having a period less than the discharge time of said reference bit line;
means for clamping said memory cell bit lines to limit a voltage excursion thereof to a first clamp voltage, and for clamping said reference bit line to limit a voltage excursion thereof to a second clamp voltage different from said first clamp voltage; and
a sense amplifier having first and second inputs connected respectively to said data line and to said reference bit line for generating a data output signal which is a function of the amplitudes of said reference signal and the voltage on said data line.

4,388,706
MEMORY PROTECTION ARRANGEMENT

Clyde R. Butler, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Dec. 1, 1980, Ser. No. 211,937
Int. Cl.³ G11C 11/34
U.S. Cl. 365—226 5 Claims



1. An arrangement for protecting a plurality of memory elements, accessed by a control system, from the interruption of power from a primary power source, the memory elements having a power input requiring, for normal operation, connection to a voltage within a predetermined operating range, and at least one chip enable input, comprising:
means for referencing the voltage level of power from said primary power source to the memory elements to the voltage of a logic supply source;
first comparator means for coupling to the logic supply power source, normally providing a first voltage within the predetermined operating range, for (a) determining whenever the voltage of the logic supply source falls below a second voltage within the predetermined operating range and (b) providing a first comparator signal indicative thereof;
an address decoder for (a) receiving addresses of memory elements to be accessed by the control system and (b) providing chip enable signals for coupling to the chip enable of each of said memory elements, the address decoder having a master enable input; and
latch means, for receiving the first comparator signal and providing in response thereto a master disable signal, indicative of the voltage of the logic supply power source falling below the second voltage; the master disable signal being coupled to the master enable input of the address decoder, the master disable signal operating to disable all

memory elements coupled thereto at the next memory cycle of the control system.

4. A memory protection arrangement, comprising:

plural memory elements, each having a chip enable input;

first latched voltage comparator means for comparing the voltage level of a primary power supply providing power to said memory elements with a predetermined threshold voltage and providing a disable signal to said chip enable inputs to prevent lost data that would otherwise occur as a result of a short chip enable from a power interruption; and

second voltage comparator means for sensing the voltage level of an external logic power supply and disabling said memory elements to protect them from spurious signals which may occur during application and removal of power from said primary power supply.

4,388,707

MEMORY SELECTING SYSTEM

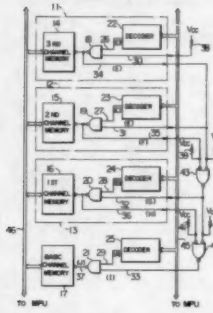
Shigeru Komatsu; Kazushi Mizukami; Tsuguji Tachiuchi, all of Yokohama; Kunihiko Nagai, Zushi, and Takuo Koyama, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 30, 1981, Ser. No. 279,071

Claims priority, application Japan, Jun. 30, 1980, 55-87869

Int. Cl.³ G11C *8/00*

U.S. Cl. 365—230 **4 Claims**



4. A memory selection system comprising:

first and second memories;

first and second detection means for producing detection signals when addresses in said first and second memories are designated, respectively;

first and second control means for enabling said first and second memories for access, respectively, when said first and second detection means produce said detection signals, respectively; and

third control means responsive to the detection signal from said first detection means to disable said second memory for access independently of the presence or absence of the detection signal from said second detection means.

4,388,708

METHOD AND APPARATUS FOR DETERMINING PHYSICAL QUANTITIES

Damir M. J. Skrgatic, 203 Clement Rise, Dedridge, Livingston, West Lothian, and John S. Strachan, 20 Gloucester La., Edinburgh EH3 6ED, both of Scotland

Filed Mar. 18, 1981, Ser. No. 244,962

Claims priority, application United Kingdom, Mar. 20, 1980, 8009495; Sep. 11, 1980, 8029414

Int. Cl.³ G01B *17/00*; G01S *15/10*

U.S. Cl. 367—2 **6 Claims**

1. Apparatus for determining a physical parameter, comprising:

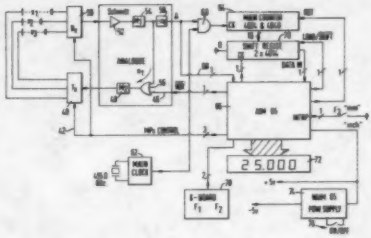
a first pulse transmitter transducer and a first pulse receiver transducer separated by a transmission path through a fluid medium,

retransmission means, responsive to receipt of a pulse by the first receiver transducer, for causing transmission of a further pulse by the first transmitter transducer,

counting means, connected to the first receiver transducer, for counting the number n of pulses received,

timing means for determining the time T required to receive said number n of pulses received,

calculating means arranged to derive a measured value of said physical parameter from n and T, and



reference means, including a second transmitter transducer and a second receiver transducer at fixed locations operating in conjunction with said retransmission, counting and timing means, for providing reference values of the time required for transmission of a number of pulses between said fixed locations which reference values vary with environmental changes in the transmission medium and operational drift in the retransmission, counting and timing means,

said calculating means including means for comparing n, T and said reference values of time and the number of pulses and for adjusting said measured values of said physical parameter accordingly.

4,388,709

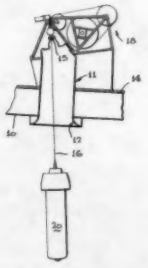
FUNNEL CONSTRUCTION FOR A DIPPING SONAR

Chester L. Reed, Burbank, and Robert M. Bridges, Northridge, both of Calif., assignors to The Bendix Corporation, Sylmar, Calif.

Filed Jan. 19, 1981, Ser. No. 225,894

Int. Cl.³ B63B *21/16*

U.S. Cl. 367—131 **9 Claims**



1. A funnel construction for a dipping sonar carried in a helicopter, said sonar including a hoist with a cable-carrying drum, a cable attached to said drum, and an underwater transducer attached to said cable, said hoist being capable of lowering said transducer into and out of a body of water from said helicopter, and

a housing in said helicopter for receiving and storing said

transducer, said funnel forming an opening into said housing

characterized in that said funnel construction includes a first cylindrical member having a slightly expanded diameter at its top rim and its lower rim, said cylindrical member passing through an opening in the bottom of said helicopter,

a flared cylindrical entrance aperture member of thin wall, aluminum alloy having its smaller end in telescoping relation with said lower rim and bonded thereto, and terminating its flared end in a large diameter annular lip extending in the same direction as its smaller end,

a partially conical strut member of aluminum alloy having a short length of axially inwardly extending annular skirt at its larger diameter end, terminating adjacent said annular lip, an inwardly tapered axially extending section at its smaller diameter end which is slightly larger than the diameter of said lower rim and positioned adjacent thereto, and terminating in a radially outwardly extending flange,

a quantity of resilient foam material positioned between said strut member and said entrance aperture member and extending over said lower rim to a first surface adjacent said flange and also to a second surface between said large diameter annular lip and said axially inwardly extending annular skirt,

sealing means sealing said first and second surfaces, and means fastening said flange to said helicopter.

4,388,710

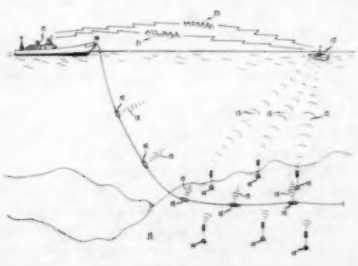
SUBMARINE CABLE TENSION TELEMETERING SYSTEM

Joseph A. Pecon, Jr., Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 13, 1981, Ser. No. 283,115

Int. Cl.³ H04B *11/00*; H02G *1/10*

U.S. Cl. 367—134 **6 Claims**



1. In a submarine cable laying system, apparatus for measuring cable tension during laying operations comprising

a separable housing for longitudinal attachment to a submarine cable before laying,

a strain gauge within said housing for producing an electric magnitude proportional to tension in said cable,

a saddle within said housing for holding said cable in a bowed condition against said strain gauge such than an increase in cable tension tends to reduce the bow in said cable and thereby increases the compressive force on said strain gauge, and

control means for translating the electric magnitude caused by compression of said strain gauge into an acoustic signal transmissible through the submarine environment.

4,388,711

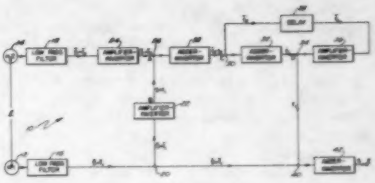
OPTIMUM FLOW NOISE CANCELLING HYDROPHONE MODULE

John W. Fay, Old Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 28, 1981, Ser. No. 287,959

Int. Cl.³ G01S *3/80*

U.S. Cl. 367—135 **5 Claims**



1. An optimum flow noise cancelling hydrophone module of a towed line array comprising:

a pair of hydrophones, a lead hydrophone and a lag hydrophone adjustably positioned adjacent one another in said towed line array;

a first filtering means for filtering the acoustic signal plus flow noise output of said lead hydrophone;

a second filtering means for filtering the acoustic signal plus flow noise output of said lag hydrophone;

a first amplifying means for amplifying and inverting the acoustic signal plus flow noise output of said first filtering means;

a second amplifying means for amplifying and twice inverting the acoustic signal plus flow noise output of said second filtering means;

a first summing means for adding the acoustic signal plus flow noise outputs of said first and said second amplifying means wherein said acoustic signals cancel leaving combined flow noise, then inverted, as the output of said first summing means;

delay loop means for cancelling said lag hydrophone flow noise component of said combined flow noise output of said first summing means and inverting said lead hydrophone flow noise then remaining; and

a second summing means for adding and inverting said acoustic signal plus flow noise output of said first filtering means and said lead hydrophone flow noise component output of said delay loop means to obtain, as the output of said second summing means, the desired acoustic signal.

4,388,712

COMBINED ELECTRONIC APPARATUS INDICATOR AND CASSETTE TAPE TRANSDUCER APPARATUS, PARTICULARLY COMBINED RADIO-RECORDER FOR AUTOMOTIVE USE

Horst Timm, Hildesheim, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,092

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927984

Int. Cl.³ G11B *31/00*

U.S. Cl. 369—10 **8 Claims**

1. Combined electronic indicator and cassette tape transducer apparatus (**10**), particularly for automotive installations, having

a housing (**12**);

a pivotable cover plate (**14**) secured to the housing;

guide means (**58**) on the cover plate for sliding movement of a cassette parallel to said cover plate to receive a tape cassette in said housing;

drive means (**20, 40, 44, 46, 50, 52**) secured within the hous-

ing and engageable with a tape in the cassette when the cassette is inserted in the cover plate and the cover plate is pivoted into a closed position;

means carrying electrical signals representative of operation of an electronic apparatus;

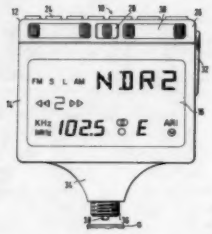
operating and control elements (**24, 24', 26, 28, 30, 32**) connected to the electrical signal carrying means and controlling the drive means;

an indicator display panel (**16**) mounted on the cover plate (**14**);

and display indicator means (**18**) on the display panel, connected to and controlled by the electrical signals carried by the signal carrying means to indicate operation of an electronic apparatus generating said signal;

the housing (**12, 72**) forming a combined and housing support for said drive means and for said operating and control elements located in, and on said housing;

and a flexible, hollow gooseneck (G) attached to said housing to provide a flexible holding support for said housing, the drive means therein, and said operating and control elements thereon.



8. Combined automobile radio receiver, cassette tape transducer apparatus and electronic indicator and operating control unit comprising a housing (**72**);

a pivotable cover plate (**14**) secured to the housing;

guide means (**58**) on a cover plate for sliding movement of a cassette parallel to said cover plate to receive a cassette in said housing;

drive means (**40, 44, 46, 50, 52**) secured within the housing and engageable with a tape in the cassette when the cassette is inserted in the cover plate and the cover plate is pivoted into a closed position;

a radio receiver located within said housing;

operating and control elements connected to the radio receiver and controlling the drive means;

an indicating display panel (**16**) mounted on a cover plate (**14**);

and display indicator means (**18**) on the display panel (**16**) connected to and controlled by electrical signals derived from said radio receiver and carrying means to indicate operation of said radio receiver generating said signals,

the housing (**72**) forming a combined housing and support for said drive means, said radio receiver and said operating and control elements.

4,388,713

ROTATION CONTROL SYSTEM IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Kazuo Tatsuguchi, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 23, 1980, Ser. No. 219,507

Claims priority, application Japan, Dec. 27, 1979, 54-173082; Dec. 27, 1979, 54-173083

Int. Cl.[3] **G11B** *17/00, 19/24*

U.S. Cl. 369—50 **4 Claims**

1. A rotation control system in an apparatus using a reproducing stylus for reproducing information signals from a rotary recording medium, said rotary recording medium having information signals recorded thereon so that the relative velocity between reproducing means and said rotary recording medium is maintained constant, said rotation control system comprising:

a motor for rotating said rotary recording medium;

positional signal obtaining means for obtaining a positional signal corresponding to the position of said reproducing stylus on said rotary recording medium;

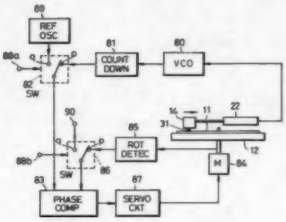
variable frequency oscillating means responsive to said positional signal for producing a signal having a frequency which varies in accordance with said positional signal;

rotation detecting means for detecting the rotation of said motor;

comparing means for comparing the output signal of said variable frequency oscillating means with the output signal of said rotation detecting means, to produce an output difference signal;

controlling means for controlling the rotation of said motor in response to said difference signal;

a reference oscillator means for generating a reference frequency signal;



synchronized signal separating and supplying means for separating a synchronized signal from a signal reproduced from said rotary recording medium by use of said reproducing stylus;

a first switching means for selectively supplying the output of said variable frequency oscillating means and the output of said reference oscillator means to said comparing means; and

a second switching means for selectively supplying the output of said rotation detecting means and the synchronized signal of said synchronized signal separating and supplying means coupled said switching means to said comparing means,

said first and second switching means respectively supplying the outputs of said variable frequency oscillating means and said rotation detecting means to said comparing means before a starting of a normal reproduction, and said first and second switching means being switched over to respectively supply the output of said reference oscillator means and the synchronized signal of said synchronized signal separating and supplying means to said comparing means upon normal reproduction.

4,388,714

TECHNIQUE FOR UNIFORM STYLUS CONFIGURATION

Eugene O. Keizer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

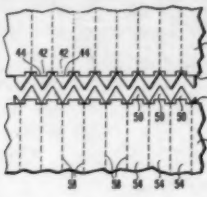
Division of Ser. No. 141,939, Apr. 21, 1980, Pat. No. 4,330,915. This application Aug. 17, 1981, Ser. No. 293,152

Int. Cl.[3] **G11B** *3/44*

U.S. Cl. 369—173 **5 Claims**

1. In a stylus having a shank and a tip at one end of said shank, said tip being prefabricated from a material different from the material of said shank and having a face thereof oriented along a predetermined crystallographic plane, the

improvement comprising said tip being attached to said shank by an interlocking mortise-and-tenon joint fabricated as an



integral part of said tip, whereby a specific orientation of said crystallographic plane with respect to said shank is achieved.

4,388,715

ALARM PREPROCESSOR LOGIC

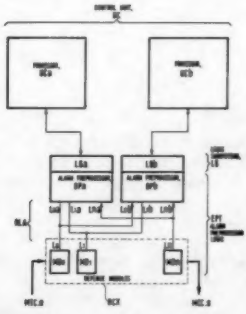
Yves Renaudin, La Montgolfiere, and Daniel Bordon, Les Ulis, both of France, assignors to Compagnie industrielle Des Telecommunications Cit-Alcatel, Paris, France

Filed Jul. 31, 1980, Ser. No. 174,059

Claims priority, application France, Aug. 3, 1979, 79 19946

Int. Cl.³ H04J *3/14*; H04Q *11/04*

U.S. Cl. 370—13 **12 Claims**



1. An alarm preprocessing logic system for use in a computer controlled digital switching exchange including a central computer, the alarm preprocessing logic system comprising: defence modules each allotted to a respective portion of the exchange for detecting a plurality of types of alarm therein; means for forwarding detected alarms via redundant alarm data transmission means (CAa, CAb, SLM1, SLM2, COL) to alarm processing logic including (i) means for confirming said alarms (PT2) (ii) means for attributing a category to said alarms depending on type of said alarm and on the exchange unit which originated the alarm and (iii) means for grouping said alarms according to the category attributed thereto (PT1, MDI, MAP), and for classifying said alarms in an order of priority; the alarm processing system further comprising: data interchange logic connecting the alarm processing logic to the exchange central computer and arranged to ensure that said alarms are sent to the central computer in said order of priority.

4,388,716

TWO-WAY TRANSMISSION SYSTEM

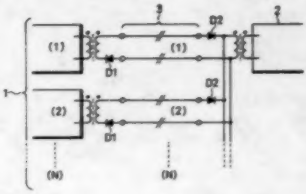
Fumihiko Takezoe, and Minoru Koyama, both of Hino, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

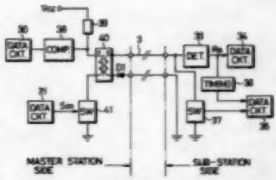
Filed Nov. 13, 1980, Ser. No. 206,603

Claims priority, application Japan, Nov. 15, 1979, 54-147023; Feb. 22, 1980, 55-20486

Int. Cl.³ H04L *5/14*

U.S. Cl. 370—29 **6 Claims**





5. An insulated type signal transmission system comprising: a transmission line, one pulse transformer coupled to said transmission line, a first diode means coupled in series with a second winding of said pulse transformer at a first terminal thereof and a second diode means coupled in series with said second winding at a second terminal thereof, and a plurality of signal transmitting circuits connected in parallel and coupled to said first terminal and said second terminal of said second winding of said pulse transformer.

4,388,717

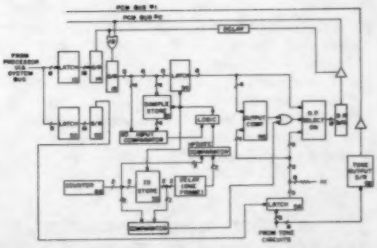
CONFERENCE CIRCUIT FOR PCM SYSTEM

Michael G. Burke, Corinth, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 14, 1981, Ser. No. 224,970

Int. Cl.³ H04Q *11/04*

U.S. Cl. 370—62 **4 Claims**



1. A conference circuit for a telecommunications system in which speech data for conference calls is transmitted internally in digital form over a plurality of time division channels in recurring time frames, said circuit comprising: means for storing digital samples of speech from each conference call, first comparison means, means for transferring digital samples for a

call from said storing means for comparison in said first comparison means with a current sample received from said call, means for storing the current sample in said storing means in place of the previously stored sample when the current sample indicates greater amplitude than the previously stored sample, a second comparison circuit, a tone generator, means for enabling a digital signal output from the tone generator representative of a tone for transmission to said second comparison circuit, said second comparison circuit compares the greater amplitude sample from the first comparison circuit with the digital tone representation to determine which signal input to the second comparison circuit is louder, and means for transmitting at the end of a frame a signal representing the louder signal from said second comparison circuit to said time division channels.

4,388,718

DIGITAL TELECOMMUNICATION SYSTEM

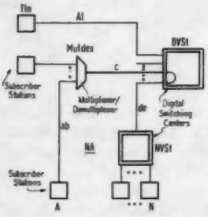
Peter Gerke, Graefelfing, and Joachim Petersen, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 228,675

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003290

Int. Cl.[3] **H04J** *3/00;* **H04Q** *11/04*

U.S. Cl. 370—110.1 **1 Claim**



1. A digital communication system comprising:

means defining a plurality of 64 kbit/s channels each of which includes a 56 kbit/s primary channel and an 8 kbit/s auxiliary channel;

a plurality of subscriber stations and a switching center interconnected via said channels;

means for selectively operating the primary channels to carry pulse code modulated or Δmodulated speech signals, rapid fixed image signals and rapid data signals from subscriber-to-subscriber;

means for selectively operating the auxiliary channels to carry information signals including exchange-oriented switching signals, slow data transmission signals, slow fixed image signals and subscriber-to-subscriber control signals, and special service indication signals including remote control signals; and

means in said switching center operated to constantly read said auxiliary channels and selectively insert into and extract from said auxiliary channels the information signals in accordance with the special service indication signals read from said auxiliary channels.

4,388,719

DYNAMIC SIGNAL GENERATOR

George E. Soltysik, Russell, Pa., and John C. R. Anderson, Jamestown, N.Y., assignors to Loranger Manufacturing Company, Warren, Pa.

Filed Jan. 16, 1981, Ser. No. 225,673

Int. Cl.[3] **G06F** *11/00;* **G01R** *31/28*

U.S. Cl. 371—27 **7 Claims**

1. A dynamic signal generating circuit for semiconductors comprising:

a first starting address selector **11** and a second starting address selector **22**,

a first address counter means **12** and second address counter means **23**,

first interval counter means **13** and second interval counter means **24**,

first interval time means **14** and second interval time means **25**,

first output signal means **15** and second output signal means **26**,

an address counter **16**,

a programming card **17**,

address multiplexers **18**,

address signal means **21**,

data pattern generators **19**, and

data signal means **20**,

clock drivers **57**,

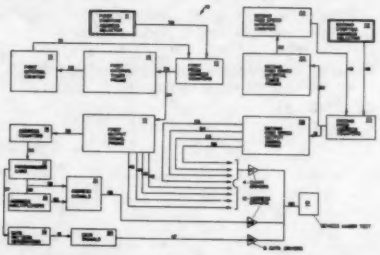
address drivers **58**,

data driver means **59**,

said starting address selectors **11** and **22** being connected to said first address counter means **12** and said second address counter means **23** respectively,

said first address counter means **12** being connected to said first interval timer means **14** and to said first output signal means **15** respectively,

said first interval timer means **14** being connected through said first interval counter **13** to said first address counter means **12**,



said second address counter means **23** being connected through said second interval timer means **25** to second interval counter means **24**, said second address counter means **23** being also connected to said second output signal means **26**,

said second interval timer means **25** being connected through said second interval counter **24** to said second address counter **23**,

said first output signal means **15** being connected through said address counter means **16** to said programming card **17**,

said programming card **17** being connected to said data pattern generators **19**, to said address multiplexers **18**, and to said address signal means **21**,

said address multiplexers **18** being connected to said address signal means **21**,

said data pattern generator **19** being connected to said data signal means **20** and then connected through said data drivers means **59** to devices under test,

said address signal means **21** being connected through address drivers **58** to said device under test,

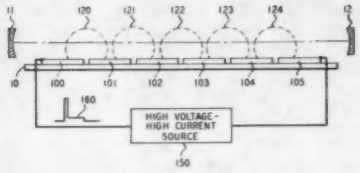
said first output signal means **15** and said second output signal means **26** being adapted to be connected through said clock drivers **57** to said device under test whereby a wide range of frequency and amplitude and intervals of signals is adjusted in said circuit and it is adapted to provide at least ten signals of all extremes at one time and to change from said ten signals to any one of different characters instantaneously.

4,388,720

EXTERNAL CONTROL OF RECOMBINATION RATE FOR ELECTRON-ION RECOMBINATION LASERS

William T. Silfvast, Holmdel; Leo H. Szeto, Howell, both of N.J., and Obert R. Wood, II, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 6, 1981, Ser. No. 251,168
Int. Cl.³ H01S 3/097
U.S. Cl. 372—76 11 Claims



1. A plasma-recombination laser which comprises

a resonant laser cavity;

means for producing a plasma laser medium in said resonant laser cavity;

characterized in that

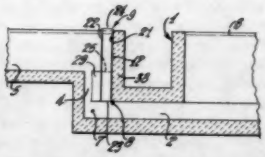
said means for producing a plasma laser medium comprises a material, and means for applying energy to said material in at least two times segments such that the energy during a first time segment is sufficient to produce a plasma from said material, which plasma expands into said resonant laser cavity, and the energy during a second time segment maintains the electron temperature of said plasma high enough to prevent substantial electron-ion recombination in said plasma until recombination is desired.

4,388,721

THROAT UPWELL BAFFLE

Herbert L. Hall, Jr., Newark, and Isac M. Sheinkop, Reynoldsburg, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 3, 1981, Ser. No. 289,568
Int. Cl.³ C03B 5/027
U.S. Cl. 373—31 7 Claims



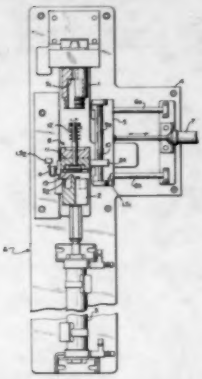
2. In a channel for conducting fluid glass which channel comprises a refractory duct and a channel extending vertically therefrom and formed by upstream and downstream vertical walls, the improvement comprising a chimney having vertical walls and open at its lower end being positioned in contact with said upstream vertical wall.

4,388,722

AUTOMATIC CLEANING DEVICE FOR USE IN AN EXTRACTING FURNACE OF AN APPARATUS FOR ANALYZING GASES IN METALS

Masahiro Tanimoto, Kyoto, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed Jun. 17, 1981, Ser. No. 274,370
Claims priority, application Japan, Jul. 5, 1980, 55-91989
Int. Cl.³ H05B 3/00
U.S. Cl. 373—118 27 Claims



1. In an extracting furnace for use with a gas analyzing device, said furnace being of the type including upper and lower electrodes relatively movable between a closed position, whereat a crucible containing a sample to be analyzed may be contacted and heated by said upper and lower electrodes, and an open position, whereat said upper and lower electrodes are spaced from each other, the improvement comprising an automatic cleaning device for cleaning said upper and lower electrodes when said electrodes are in said open position, said cleaning device comprising:

a support bracket mounted for movement laterally of said electrodes;

a cleaning unit supported on said support bracket and movable thereby between a first position located laterally of said electrodes and a second position located between said electrodes;

crucible removal means on said cleaning unit for removing a spent crucible from said electrodes upon movement of said cleaning unit to said second position thereof;

said cleaning unit including upper and lower cleaning elements operable for cleaning said upper and lower electrodes; and

said cleaning unit being mounted on said support bracket for vertical movement relative thereto, such that when said cleaning unit is in said second position thereof, relative movement between said upper and lower electrodes toward said closed position thereof moves said cleaning unit vertically until said upper and lower cleaning elements are contacted with and clean said upper and lower electrodes.

4,388,723

CONTROL DEVICE FOR STEERABLE NULL ANTENNA PROCESSOR

James Keen, Belford, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 1, 1981, Ser. No. 279,397
Int. Cl.³ H04K 3/00
U.S. Cl. 375—1 10 Claims

1. A radio receiving system for use in an electronic counter-

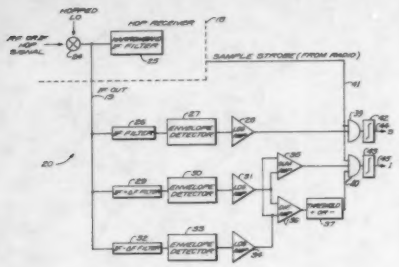
counter measure (ECCM) system to overcome jamming and other interference (I), in which ECCM system a radio transmitter broadcasts signals (S) on a narrow selected frequency which is rapidly changed to provide fast frequency hopping (FFH), the ECCM receiving system comprising:

an antenna system which receives over the broadband spread spectrum of radio frequencies of the transmitter,

a steerable null antenna processor means connected to said antenna system to create an effective antenna null pattern with the null in the direction of broadband interference,

a fast frequency hopping (FFH) radio receiver means connected to said antenna processor means to avoid narrowband jamming by rapidly changing its narrow receiving frequency in synchronism with the corresponding frequency changes at the transmitter, said FFH radio means producing an intermediate frequency (IF) containing the signal (S) and interference (I); and

a control device connected to said (FFH) radio receiver means, said control device having a first and second output port connected to said antenna processor means and having at least three narrowband IF filter means for receiving a portion of the intermediate frequency (IF), the first of said IF filter means being connected to a first summing means to provide the signal (S) level at said first output port and the second and third of said IF filter means, each differently offset from the IF frequency, being connected to a second summing means to produce the interference (I) level at said second output port.



4,388,724

ADAPTIVE EQUALIZER DEVICE

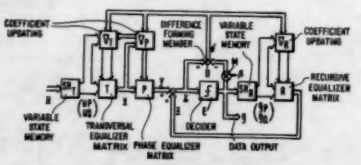
Heinz Göckler, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 9, 1981, Ser. No. 223,772

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1980, 3000856

Int. Cl.³ H04B 3/14

U.S. Cl. 375—14 **7 Claims**



1. In a device for the adaptive equalization of multiphase and/or multiamplitude modulated data signals, which device includes a decider, an equalizer having an output connected to the input of said decider for equalizing received data signals, and a difference forming member connected to produce an output signal representative of the difference between the input and output signals of said decider, said output signal of said difference forming member being supplied to said equalizer as a control value for adaptively setting the equalizer coefficients; the improvement comprising a multiplier, connected in a signal branch of said device containing a data signal which is fed to said input of said decider, for multiplying the data signal in said branch by a positive scalar value, such that a desired scaling of the equalizer coefficients takes place.

4,388,725

BUS TRANSMISSION SYSTEM

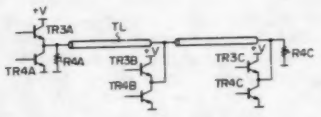
Seiichi Saito, Kawasaki, and Yuji Kitano, Yokohama, both of Japan, assignors to A. Aoki & Associates, Tokyo, Japan

Filed Nov. 26, 1980, Ser. No. 210,674

Claims priority, application Japan, Nov. 29, 1979, 54-154575

Int. Cl.³ H03K 7/08, 17/00, 19/00

U.S. Cl. 375—36 **12 Claims**



1. A bus transmission system including transmitting means for transmitting data over a transmission line, said system comprising at least two drive circuits connected to said transmission line, and a source voltage comprising:

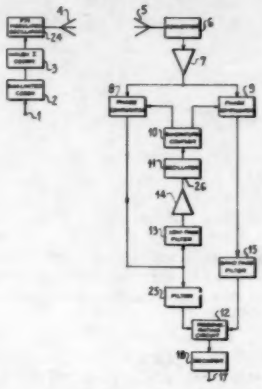
first and second terminal resistors each having a first terminal operatively connected to opposite ends of the transmission line, each having a second terminal operatively connected to ground and each having a terminal resistance which is nearly equal to the characteristic impedance of the transmission line for forcing the transmission line to ground level between data transmissions;

said at least two drive circuits each having an output voltage and an output impedance and each having three states, said states including a first-level state in which the output voltage is at a first level which is ground level and the output impedance is a low impedance, a second-level state in which the output voltage is at a second level corresponding to the source voltage and the output impedance is the low impedance and a high-impedance state in which the output impedance is a high impedance resulting in substantially decoupling the respective drive circuit from said transmission line, and each having means for detecting the signal transmitting condition and state means, responsive to said detecting means, for state changing which when said data is not to be transmitted places said drive circuits in the high-impedance state, and when said data is initially transmitted, the high-impedance state of said drive circuits being converted into the first-level state in which the output impedance is at the low impedance, thereafter said data being transmitted by said transmitting means based upon the first-level state and the second-level state, and when the transmission of said data is finished, each drive circuit being placed in the first-level state again and thereafter being placed in the high-impedance state by said state means.

4,388,726
SYSTEM FOR THE ULTRA-HIGH FREQUENCY TRANSMISSION OF NUMERICAL DATA

Jean P. Debaene, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 20, 1980, Ser. No. 161,557
Claims priority, application France, Jun. 22, 1979, 79 16058
Int. Cl.³ H04B 12/00
U.S. Cl. 375—44 4 Claims



1. A system for communicating data over a radio channel comprising:

a transmitter including:

a coding device adapted to receive the data transmitted at a timing 1/T and providing a coded-signal output, the coding device including a first coder for coding blocks of n successive symbols of data of period T into blocks of N symbols of period $T' < T$ and having two (2) states, n and N being whole numbers and $N > n$, each block of N symbols being sum-limited, and a second coder connected to the first coder and providing a Walsh I coding of the sum-limited symbols from the first coder, and

a frequency modulating oscillator for generating a signal modulated with the coded signal provided by said coding device, and

a receiver including:

means for receiving the modulated signal transmitted by the transmitter,

a coherent-phase demodulator, coupled to the receiving means, for restoring the succession of binary elements of period T', and

a decoding device, coupled to the coherent phase demodulator, including a decoder providing a decoding function inverse of that provided by the first coder of said transmitter.

4,388,727
RECEIVERS SUITABLE FOR USE IN REMOTELY-OPERABLE SWITCHING DEVICES AND DATA TRANSMISSION SYSTEMS

Eric Metcalf, Alresford, England, assignor to Sangamo Weston Limited, Enfield, England

Filed Feb. 17, 1981, Ser. No. 235,276
Claims priority, application United Kingdom, Feb. 18, 1980, 8005455
Int. Cl.³ H04L 27/14; H04B 1/26
U.S. Cl. 375—88 1 Claim

1. A receiver for receiving a signal comprising a carrier signal which can have at least one of two predetermined frequencies f_{1a} and f_{1b} and which is modulated with a digital signal, the receiver comprising:

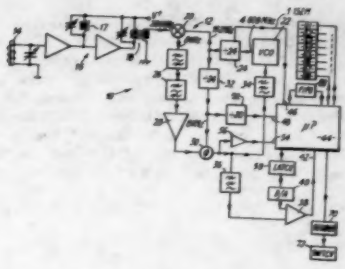
an input circuit for receiving the modulated carrier signal;

variable-frequency oscillator means for producing a signal of frequency f_2;

a first mixer circuit responsive to the signal received by the input circuit and the signal of frequency f_2 to produce a first intermediate signal whose frequency is at least one of $|f_{1a}-f_2|$ and $|f_{1b}-f_2|$;

frequency divider means responsive to a signal produced by the variable frequency oscillator means to produce first and second frequency-divided signals whose frequencies are $|[(f_{1a}+f_{1b})/2]-f_2|$ and $|f_{1a}-f_{1b}|/2$ respectively;

a second mixer circuit responsive to the first intermediate signal and the first frequency-divided signal to produce a second intermediate signal of frequency $|f_{1a}-f_{1b}|/2$;



phase detector means responsive to the second intermediate signal and the second frequency-divided signal to produce an output signal having a DC component dependent upon the phase difference between said second intermediate and second frequency-divided signals, said output signals also containing said digital signal;

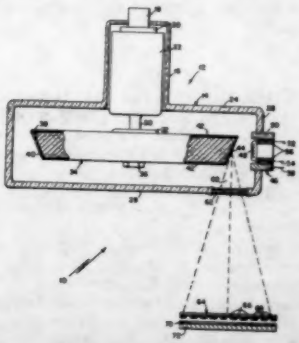
low-pass filter means responsive to said output signal for substantially attenuating said digital signal while applying said DC component to said oscillator means to vary the frequency thereof in the sense which tends to reduce said phase difference, and thus tends to reduce the frequency difference between said second intermediate and second frequency-divided signals; and

means for deriving said digital signal from said output signal.

4,388,728
SOFT X-RAY LITHOGRAPHY SYSTEM

Saurabh D. Emmanuel, Stamford, Conn., assignor to The Machlett Laboratories, Incorporated, Stamford, Conn.

Filed Nov. 20, 1978, Ser. No. 962,446
Int. Cl.³ G03B 41/16
U.S. Cl. 378—34 14 Claims



1. An X-ray lithography method comprising the steps of:

disposing an X-ray source having a target made of a chemical compound material for emitting X-rays characteristic of the elements in said compound along a predetermined path;

disposing in said path a filter made of material transmissive to X-rays characteristic of only one of said elements;

disposing in alignment with said filter a mask having a portion transmissive to X-rays characteristic of said only one of said elements; and

disposing in alignment with said portion of the mask a workpiece having a surface portion coated with a material sensitive to X-rays characteristic of said only one of said elements.

4,388,729

SYSTEMS FOR REDUCING NOISE IN VIDEO SIGNALS USING AMPLITUDE AVERAGING OF UNDELAYED AND TIME DELAYED SIGNALS

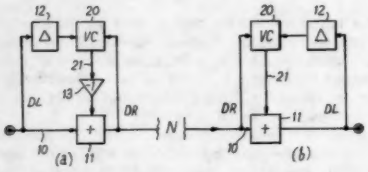
Paul A. Spencer, and Ray M. Dolby, both of London, England, assignors to Dolby Laboratories, Inc., San Francisco, Calif.

Continuation of Ser. No. 629,541, Nov. 6, 1975, abandoned, which is a continuation of Ser. No. 450,903, Mar. 13, 1974, abandoned. This application Jun. 30, 1978, Ser. No. 921,045

Claims priority, application United Kingdom, Mar. 23, 1973, 14272/73

Int. Cl.³ H04B 1/64; H04N 5/21; H04J 3/18; H04B 1/64

U.S. Cl. 455—72 **60 Claims**



50. A signal processor for processing an input signal and comprising means for providing an output signal from a plurality of related signals with similar wave shapes and including at least first and second related signals with differing signal delays relative to the input signal and a further related signal with the same signal delay relative to the input signal as the first related signal, means for deriving each of said related signals from a signal selected from one of said input and output signals, at least one related signal being derived from the output signal, variable combining means for variably and additively combining the first and second related signals to provide the output signal and responsive to a difference between the first and second related signal to exclude from the combination, when the said difference is not small, the second related signal and to replace the excluded second related signal by the further related signal.

4,388,730

NOISE DETECTOR AND DATA SIGNAL RECEIVER FOR A FREQUENCY MODULATION SYSTEM

Donald H. Nash, Colts Neck, and Duen H. Yen, Shrewsbury, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 6, 1981, Ser. No. 251,320

Int. Cl.³ H04B 1/10, 1/16

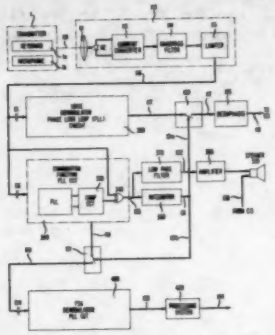
U.S. Cl. 455—208 **13 Claims**

1. In a frequency modulated signal receiver, a noise detector and signal receiver

characterized by

a phaselock loop circuit (300) responsive to the received signal, the phaselock loop circuit for providing a first output signal (505, 506) representative of the carrier-to-noise ratio of the received signal and for providing a second output signal representing a demodulated received signal,

the phaselock loop circuit comprising a phaselock loop, a comparator amplifier (330) and an exclusive OR gate (340)



connected in series configuration, the exclusive OR gate being responsive to the comparator amplifier and the comparator amplifier being responsive to the phaselock loop.

4,388,731

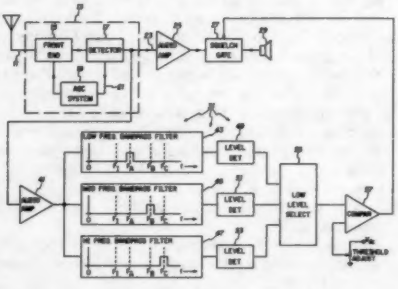
RECEIVER WITH SQUELCH FOR OFFSET CARRIER ENVIRONMENT

Dennis D. King, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 1, 1981, Ser. No. 279,894

Int. Cl.³ H04B 1/10

U.S. Cl. 455—221 **16 Claims**



1. A receiver comprising:

demodulator means,

demodulator intelligence processing means including gating means, and

squelch circuit means connected for receiving an input $e_d(t)$ from the demodulator means, $e_d(t)$ containing noise energy, and, possibly, intelligence energy, and interference energy said squelch circuit means further connected for controlling said gating means and comprising:

(a) first means for monitoring the energy content in each of a plurality N of different fixed portions of the part of the $e_d(t)$ spectrum adjacent the part of the $e_d(t)$ spectrum normally predominated by intelligence energy when intelligence is present in $e_d(t)$,

(b) second means, responsive to said first means, for selecting the portion containing the least energy, and

(c) third means, responsive to said second means, for (i) controlling said gating means to a receiver-enable condition when the energy in the selected portion is below a

predetermined threshold, and (ii) controlling said gating means to a receiver-quieting condition when the energy in the selected portion is above said predetermined threshold.

4,388,732

FIBER OPTIC DATA LINK

Allen B. Hansel, Wayside, N.J., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 6, 1981, Ser. No. 280,394
Int. Cl.³ H04B 9/00
U.S. Cl. 455—608 **8 Claims**

1. In a single optical fiber data link for transmitting data from a transmitter to a receiver over an optical fiber, the link including:

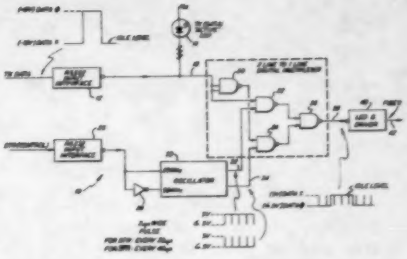
means to detect light issuing from one end of an optical fiber at two different intensity levels and output a signal at two known levels;

a low pass filter responsive to said output signal to separate square wave signals at a frequency below the cutoff frequency of said low pass filter from said output signal, said separated square wave signal representing the data transmitted over the data link;

a high pass filter responsive to said output signal to separate control pulses at a frequency above the cutoff frequency of said high pass filter from said output signal;

means to determine whether said control pulses are at least at one frequency and to produce a first control signal at one level and to produce said first control signal at a second level if said control pulses occur at a rate below said one frequency; and

means to determine whether said control pulses occur at a



rate at least at a second frequency less than said one frequency and to produce a second control signal at one level and to produce said second control signal at a second level if said control pulses occur at a rate below said second frequency.

DESIGN PATENTS

GRANTED JUN. 14, 1983

ERRATA

For CLASS	See PATENT NO.
D07–383	269,347

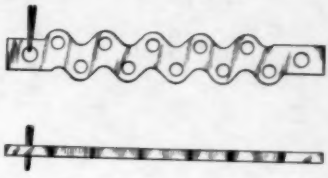
DESIGNS

JUNE 14, 1983

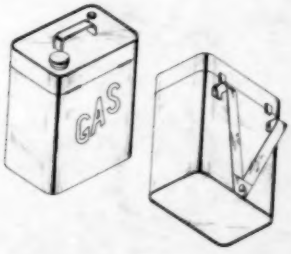
269,304
HELMET LINER
Sarah Schonwetter, and Steven B. Schonwetter, both of 585 Warren Ave., Kingston, Pa. 18704
Filed Nov. 3, 1980, Ser. No. 203,375
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—260

269,305
SANDAL
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, Tokyo; Kenshun Ishii, Tokyo, and Yukio Ishige, Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Feb. 20, 1981, Ser. No. 236,388
Claims priority, application Japan, Dec. 16, 1980, 55-52515
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—292

269,306
BELT MOUNTED HOLDER FOR GOLF TEES, RIFLE CAPS, OR SIMILAR ARTICLE
Forest L. Middleton, 611 Bowens Mill Rd., Middleville, Mich. 49333
Filed Nov. 3, 1980, Ser. No. 203,411
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—400



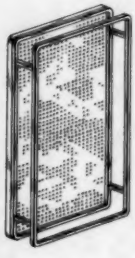
269,307
HITCHING TRAVEL CASE
James L. Laughlin, 229 Dibblee La., Eugene, Oreg. 97404
Filed Aug. 26, 1980, Ser. No. 181,503
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—32



269,308
KEY HOLDER
John G. Goessling, Ladue, and David P. Lage, Manchester, both of Mo., assignors to Quick Point, Inc., Fenton, Mo.
Filed Jun. 26, 1981, Ser. No. 277,874
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—61

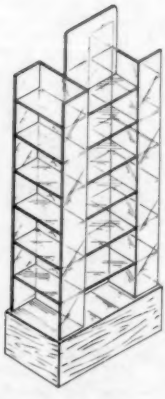
269,309
STOOL OR THE LIKE
Rodney Pickler, Rte. 1, Box 731, Robbins, N.C. 27325
Filed Jun. 15, 1981, Ser. No. 273,721
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36

269,310
MERCHANDISE DISPLAY RACK
Richard E. Wells, 151 Avenida, La Habra, Calif. 91631
Filed Jun. 16, 1980, Ser. No. 159,871
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—85

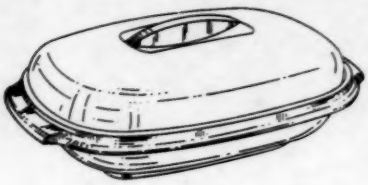


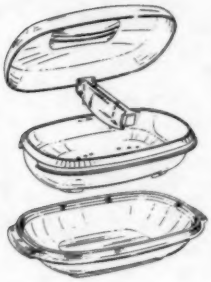
269,311
ARCHERY RACK OR THE LIKE
Robert J. Castro, 109 Dale Dr., Rockville, Md. 20850
Filed Mar. 24, 1981, Ser. No. 247,157
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—129

269,312
ARTICLE DISPLAY RACK
Vincent L. Marks, Jr., Rhinebeck, N.Y., assignor to Daniel E. Gelles Associates, Inc., New York, N.Y.
Filed Mar. 30, 1981, Ser. No. 248,705
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—175

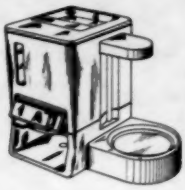


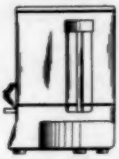
269,313
SERVING DISH
James B. Swett, Altamonte Springs, Fla.; Robert F. Bateman, Greenville, R.I., and Richard A. Boucher, Fitchburg, Mass., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Jun. 2, 1977, Ser. No. 802,753
Term of patent 14 years
Int. Cl. D07—*01, 04*
U.S. Cl. D7—3

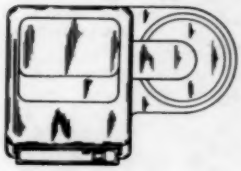




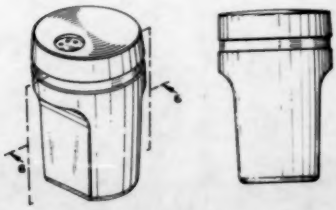
269,314
COFFEE MAKER
Teizo Sato, Suita, Japan, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 4, 1981, Ser. No. 240,534
Claims priority, application Japan, Sep. 5, 1980, 55-36629
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—309



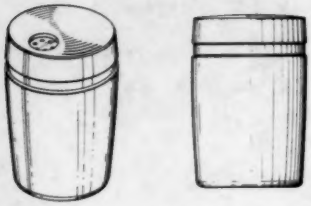




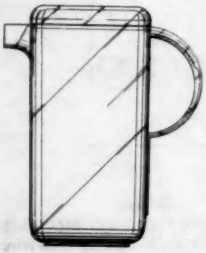
269,315
CONDIMENT SHAKER OR THE LIKE
Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Apr. 24, 1981, Ser. No. 257,075
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—54

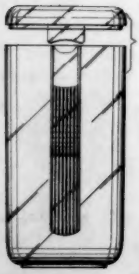


269,316
GRANUAL DISPENSER OR THE LIKE
Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Apr. 24, 1981, Ser. No. 257,076
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—54

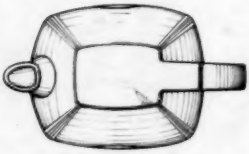


269,317
CARAFE
Ambrogio Pozzi, Gallarate, Italy, assignor to F.LLI Guzzini S.p.A., Recanati, Italy
Filed Mar. 30, 1981, Ser. No. 248,792
Claims priority, application Italy, Sep. 29, 1980, 22951
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—317





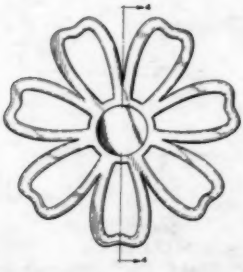
269,318
MICROWAVE TEA KETTLE
Curtis R. Blanchard, Osterville, Mass., assignor to General Housewares Corp., Hyannis, Mass.
Filed Jun. 2, 1981, Ser. No. 269,697
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—312



269,319
WOK
Peter M. Fox, West Bend, Wis., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Mar. 12, 1981, Ser. No. 243,024
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—360

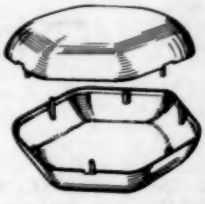
269,320
SKILLET-OVEN
Dan E. Gremonprez, West Bend, Wis.; David L. Painter, and William Cesaroni, both of Glenview, Ill., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Jul. 6, 1981, Ser. No. 279,927
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—360

269,321
TRIVET
Joseph A. Zannini, Providence, R.I., assignor to Gerity Products, Inc., Toledo, Ohio
Filed Apr. 13, 1981, Ser. No. 254,401
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—388

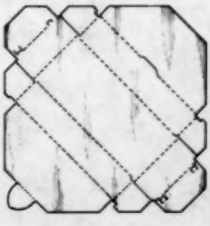


269,322
BOTTLE
Pierre Le Grand, Fecamp, France, assignor to Newfoundland Liquor Corporation, St. John's, Canada
Filed Apr. 6, 1981, Ser. No. 251,167
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—318

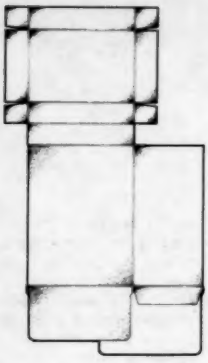
269,323
PACKAGING CONTAINER
Renzo Cillario, Alba, Italy, assignor to Ferrero S.p.A., Alba, Italy
Filed Jun. 5, 1980, Ser. No. 156,518
Claims priority, application Italy, Dec. 20, 1979, 53830/79[U]
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—424



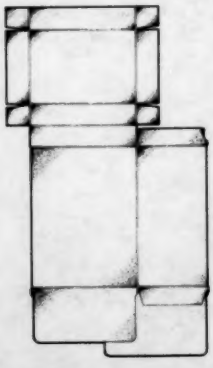
269,324
BLANK FOR DIAGONALLY FOLDED CARTON
Kenneth W. Klein, Aurora, Ind., assignor to Alton Packaging Corporation, Alton, Ill.
Filed Nov. 10, 1980, Ser. No. 205,508
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433



269,325
BLANK FOR A PACKAGING CONTAINER
Hans R. I. Linner, Helsingborg, Sweden, assignor to AB Akerlund & Rausing, Sweden
Filed Apr. 9, 1981, Ser. No. 252,275
Claims priority, application Sweden, Oct. 17, 1980, 802025
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433

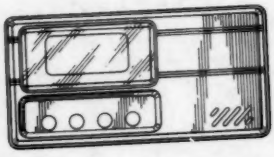


269,326
BLANK FOR A PACKAGING CONTAINER
Hans R. I. Linner, Helsingborg, Sweden, assignor to AB Akerlund & Rausing, Sweden
Filed Apr. 9, 1981, Ser. No. 252,276
Claims priority, application Sweden, Oct. 17, 1980, 802026
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433

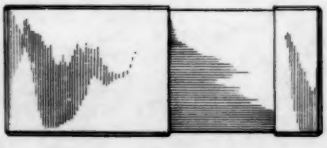


269,327
DISPENSER TOP FOR A PRESSURIZED CONTAINER
Paul M. Kotuby, Naugatuck, Conn., assignor to Risdon Corporation, Naugatuck, Conn.
Filed Apr. 8, 1981, Ser. No. 252,045
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—448

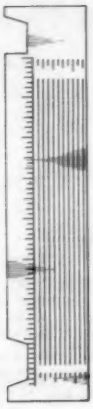
269,328
CLOCK
Michael Cheung, Shaukiwan, Hong Kong, assignor to Promoters Ltd., Hong Kong
Filed Oct. 24, 1979, Ser. No. 87,822
Claims priority, application United Kingdom, Apr. 30, 1979, 79/989738
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



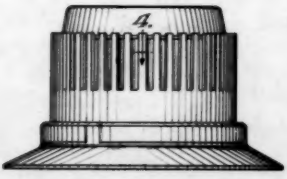
269,329
ALARM CLOCK CASE
Jean G. Malamoud, Saint-Jorioz, France, assignor to S. T. Dupont, Paris, France
Filed Aug. 8, 1980, Ser. No. 176,445
Claims priority, application France, Feb. 20, 1980, 800440
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—18



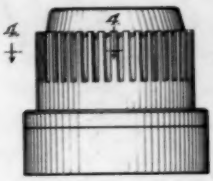
269,330
DEVICE FOR SETTING FABRIC LOOPS
Thomas O. Blair, 8026 SE. Powell Blvd., Portland, Oreg. 97206
Filed Apr. 9, 1981, Ser. No. 252,381
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



269,331
HOUSING FOR A FIRE AND SMOKE DETECTOR
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Northbrook, Ill.
Filed Oct. 8, 1981, Ser. No. 309,729
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



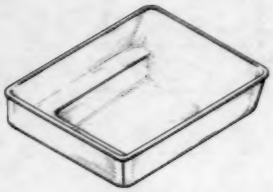
269,332
HOUSING FOR A FIRE AND SMOKE DETECTOR
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Northbrook, Ill.
Filed Oct. 8, 1981, Ser. No. 309,730
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



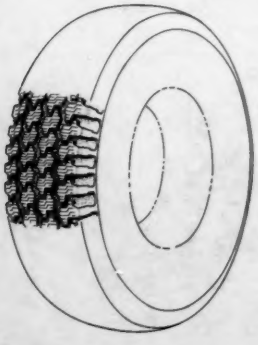
269,333
REFLECTOR FOR A WARNING LIGHT
Robert A. Ferenc, Middletown, Conn., assignor to Whelen Engineering Company, Inc., Deep River, Conn.
Filed Oct. 23, 1980, Ser. No. 200,029
Term of patent 14 years
Int. Cl. D10—*06*; D26—*05*
U.S. Cl. D10—114

269,334
RABBIT
Doreen N. Roberts, Pwllheli, Wales, assignor to Pendelfin Studios Limited, Lancashire, England
Filed Jan. 7, 1981, Ser. No. 222,859
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

269,335
WHEELBARROW ENLARGEMENT INSERT
Mack W. Eubanks, 832 Karlaney Ave., Cayce, S.C. 29033
Filed Apr. 4, 1980, Ser. No. 137,512
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—24



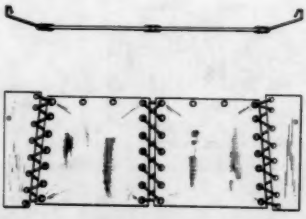
269,336
TIRE TREAD AND BUTTRESS
Charles G. Yurkovich, Boardman, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation of Ser. No. 34,704, Apr. 30, 1979, abandoned, and Ser. No. 34,705, Apr. 30, 1979, abandoned. This application Oct. 31, 1980, Ser. No. 202,895
The portion of the term of this patent subsequent to Oct. 27, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



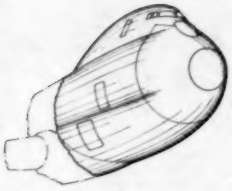
269,337
VEHICLE TIRE
Muneyoshi Maeda, Kodaira; Hiroshi Kojima, Hino, and Masaru Abe, Sayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Feb. 13, 1981, Ser. No. 234,218
Claims priority, application Japan, Aug. 13, 1980, 55-32873
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

269,338
VEHICLE TIRE
Hiroshi Kojima, Hino; Hideaki Nishio, Urawa, and Makoto Yamauchi, Sayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Feb. 13, 1981, Ser. No. 234,147
Claims priority, application Japan, Aug. 13, 1980, 55-32874
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

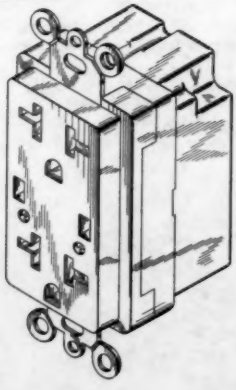
269,339
AUXILIARY CATAMARAN TRAMPOLINE
Douglas F. Hess, 3569 NE. Linda Dr., Jensen Beach, Fla. 33457
Filed Aug. 27, 1980, Ser. No. 181,793
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—318



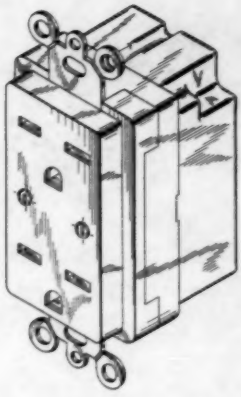
269,340
AIRPLANE FUSELAGE NOSE SECTION
William M. Harold, Edmonds, and Ronald H. Robinson, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Jul. 14, 1978, Ser. No. 924,549
Term of patent 14 years
Int. Cl. D12—06
U.S. Cl. D12—319



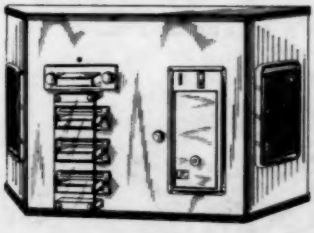
269,341
COMBINED RECEPTACLE AND GROUND FAULT CIRCUIT INTERRUPTER
Richard Doyle, Greenlawn, and Lester Rivera, Brooklyn, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Nov. 17, 1980, Ser. No. 207,330
Term of patent 14 years
Int. Cl. D13—03
U.S. Cl. D13—30



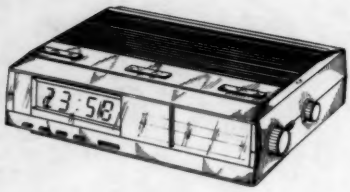
269,342
ELECTRONIC RECEPTACLE
Richard C. Doyle, Greenlawn; Lester Rivera, Glendale, and Saul Rosenbaum, East Meadow, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Oct. 7, 1981, Ser. No. 309,541
Term of patent 14 years
Int. Cl. D13—03
U.S. Cl. D13—30



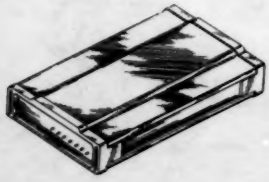
269,343
COIN OPERATED CASSETTE PLAYER OR THE LIKE
Gil Sanchez, Bronx, N.Y., assignor to SOS Incorported, Bayamon, P.R.
Filed Mar. 27, 1980, Ser. No. 134,585
Term of patent 14 years
Int. Cl. D14—01
U.S. Cl. D14—6



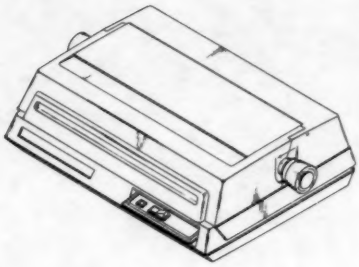
269,344
CLOCK RADIO RECEIVER
Peter H. J. Van de Ven, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 13, 1981, Ser. No. 243,420
Claims priority, application United Kingdom, Sep. 17, 1980, 996590
Term of patent 14 years
Int. Cl. D14—*03;* D10—*01*
U.S. Cl. D14—73



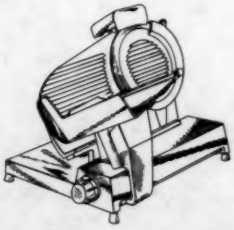
269,345
MODEM
Calvin L. Payne, Jr., Atlanta, Ga.; Vincent J. Gambello, Fort Lee, N.J.; Phillip J. Snoke, Atlanta, Ga.; William G. Jones, Marietta, Ga., and Ricky L. Sansoni, Decatur, Ga., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.
Filed Jun. 29, 1981, Ser. No. 278,217
Term of patent 14 years
Int. Cl. D14—*02;* D13—*03*
U.S. Cl. D14—107



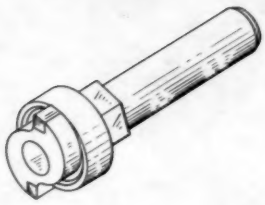
269,346
PRINTER
Angelo M. LaBarbera, Liverpool, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Jul. 6, 1981, Ser. No. 280,178
Term of patent 14 years
Int. Cl. D14—*02;* D18—*02*
U.S. Cl. D14—111



269,347
FOOD SLICER
Louis Cantatore, Edison, and J. Richard Beltram, Livingston, both of N.J., assignors to International Edge Tool Co., Roseland, N.J.
Filed May 19, 1980, Ser. No. 151,517
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—383

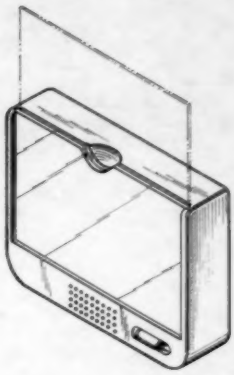


269,348
CLEANING BIT FOR DADO AND RABBET JOINTS OR THE LIKE
Bradford C. Strohmaier, 3387 Mayfair Blvd., Fresno, Calif. 93703
Filed Jul. 24, 1980, Ser. No. 171,992
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—139



269,349
COMBINED MELTER AND DISPENSER FOR THERMOPLASTIC MATERIAL
Robert H. Belter, Carmel, Calif., assignor to Slautterback Corporation, Monterey, Calif.
Filed Jan. 5, 1981, Ser. No. 222,564
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—144

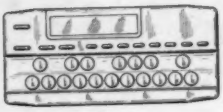
269,350
TRANSPARENCY VIEWER
Peter Lermann, Naring, and Karl-Heinz Schultheiss, Taufkirchen, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Jul. 31, 1980, Ser. No. 175,201
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—14



269,351
STRINGED MUSICAL INSTRUMENT SOUNDBOARD
Louie H. Lower, Box 151, Hayden Lake, Id. 83835
Filed Oct. 14, 1980, Ser. No. 196,381
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20

269,352
STRINGED MUSICAL INSTRUMENT BACKBOARD
Louie H. Lower, Box 151, Hayden Lake, Id. 83835
Filed Oct. 14, 1980, Ser. No. 196,382
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20

269,353
ELECTRONIC CALCULATOR WITH ELECTRONIC MUSICAL INSTRUMENT AND TIMEPIECE
Shinichi Yokoyama, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 22, 1981, Ser. No. 275,687
Claims priority, application Japan, Dec. 24, 1980, 55-54812
Term of patent 14 years
Int. Cl. D10—*02;* D17—*01;* D18—*01*
U.S. Cl. D18—2



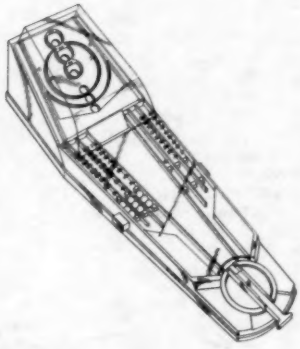
269,354
ELECTRONIC CALCULATOR
Katsuhiro Ishida, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Mar. 17, 1981, Ser. No. 244,595
Claims priority, application Japan, Sep. 18, 1980, 55-387113
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

269,355
ELECTRONIC CALCULATOR
Masafumi Yamagami, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Sep. 2, 1981, Ser. No. 298,621
Claims priority, application Japan, Mar. 6, 1981, 56-9340
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

269,356
DESK TOP ELECTRONIC CALCULATOR
Eiichi Yoshioka, Abiko; Kaname Suwa, Yokohama, and Masumi Ishiwatari, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 15, 1981, Ser. No. 302,453
Claims priority, application Japan, Mar. 20, 1981, 56-11688
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

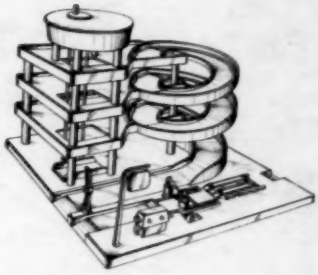
269,357
WRITING INSTRUMENT
Vivienne D. Jagger, Cuckfield, England, assignor to Little People Limited, Hong Kong
Filed Mar. 20, 1981, Ser. No. 245,960
Claims priority, application United Kingdom, Feb. 11, 1981, 998858; Feb. 11, 1981, 998859
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—45

269,358
BALL GAME HOUSING
Gordon A. Barlow, Glenview, Ill., assignor to Gordon Barlow Design, Skokie, Ill.
Filed Apr. 20, 1981, Ser. No. 255,456
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—9



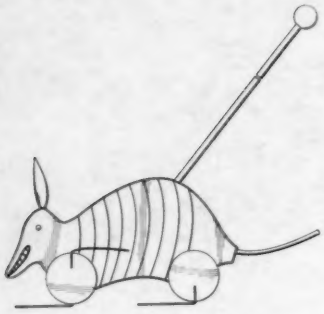
269,359
HOUSING FOR AMUSEMENT WATER TOY
Hitoshi Itakura, Gardena, Calif., and Masaaki Yoshimura, Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Mar. 10, 1981, Ser. No. 242,376
Claims priority, application Japan, Sep. 11, 1980, 55-37442
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—59

269,360
TOY GARAGE
Cheuk S. Ng, Hong Kong, Hong Kong, assignor to Tai Sang Industrial Co., Ltd., Hong Kong, Hong Kong
Filed Mar. 9, 1981, Ser. No. 241,654
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—118

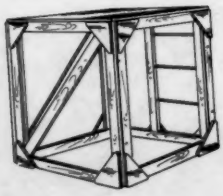


269,361
TOY CANISTER
Claire M. Marschak, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 12, 1981, Ser. No. 224,292
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—121

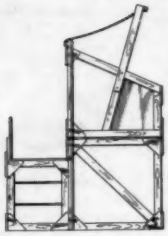
269,362
SIMULATIVE TRUNDLE TOY
Donald E. Welch, 3102 Bayou, Deer Park, Tex. 77536
Filed Mar. 13, 1981, Ser. No. 243,535
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150



269,363
PLAYGROUND CLIMBER
Berthold B. Dieter, 7545 Bono Rd., Terre Haute, Ind. 47802, and Charles L. Gibson, Terre Haute, Ind., assignors to Berthold B. Dieter, Terre Haute, Ind.
Division of Ser. No. 45,305, Jun. 4, 1979, Pat. No. Des. 261,917.
This application Aug. 28, 1981, Ser. No. 297,149
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—245



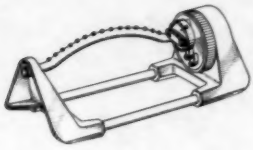
269,364
PLAYGROUND CLIMBER
Berthold B. Dieter, 7545 Bono Rd., Terre Haute, Ind. 47802, and Charles L. Gibson, Terre Haute, Ind., assignors to Berthold B. Dieter, Terre Haute, Ind.
Division of Ser. No. 45,305, Jun. 4, 1979, Pat. No. Des. 261,917.
This application Aug. 28, 1981, Ser. No. 297,152
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—245



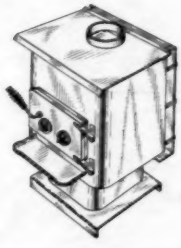
269,365
FISHING LURE
Oscar P. Obst, 27981 Camino Santo Domingo, San Juan Capistrano, Calif. 92675
Filed Feb. 12, 1981, Ser. No. 233,732
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

269,366
FISHING LURE BODY
Billy R. Ward, Amsterdam, Mo., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Apr. 30, 1981, Ser. No. 258,867
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

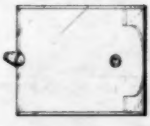
269,367
OSCILLATOR SPRINKLER
Spencer L. Mackay, Canoga Park; Steven E. Maple, Claremont, and Paul G. Mayr, Glendora, all of Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Duarte, Calif.
Filed Dec. 3, 1980, Ser. No. 212,403
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—8



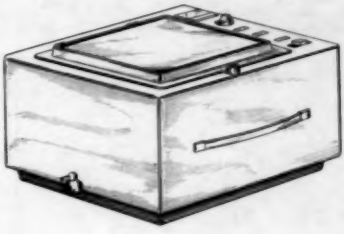
269,368
FREE STANDING STOVE
Janice E. Schrader, 2296 Debra Dr., Springfield, Oreg. 97477
Filed Aug. 17, 1981, Ser. No. 293,151
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



269,369
OXYGEN HOOD
John K. Koh, 2593 Esch, Ann Arbor, Mich. 48104
Filed Nov. 28, 1980, Ser. No. 211,360
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1.1

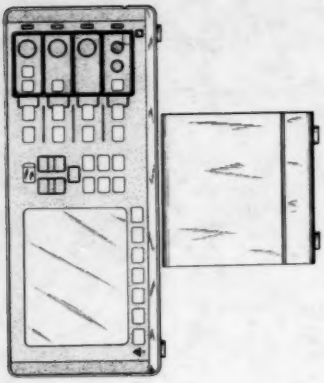


269,370
HOME PASTEURIZER
Raymond F. Groff, 45 Holiday Dr., Apt. 88, Kingston, Pa. 18704
Filed Mar. 2, 1981, Ser. No. 239,303
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—9

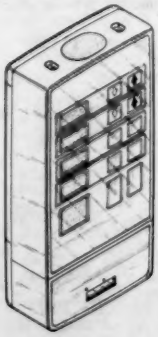


269,371
DENTAL ROOT-CANAL BROACH HANDLE
Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., France
Filed Sep. 12, 1980, Ser. No. 186,693
Claims priority, application Switzerland, Apr. 10, 1980, DM/000 139
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

269,372
PATIENT MONITORING UNIT
Edmund Reis, and Bernd Rosenfeldt, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Sep. 12, 1980, Ser. No. 186,526
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17



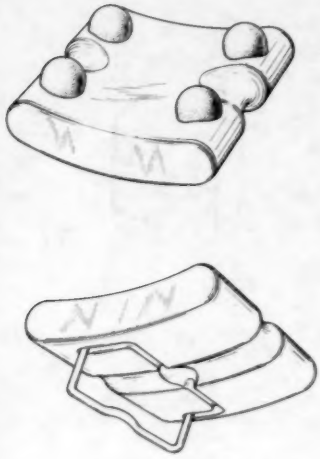
269,373
CARDIAC PACER
Kenneth W. Belt, and George L. Congdon, both of Fort Atkinson, Wis., assignors to Norland Corporation, Fort Atkinson, Wis.
Filed Nov. 25, 1980, Ser. No. 210,275
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17



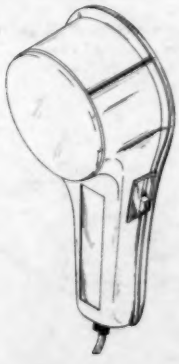
269,374
AMMONIA INHALANT PACKAGE
James B. Brown, R.F.D. #2, Box 313, Mt. Kisco, N.Y. 10549
Filed Jan. 21, 1981, Ser. No. 226,741
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—34

269,375
ROLLER MASSAGER
Isamu Masuda, Daimyo 1-chome 9-20, Chuo-ku, Fukuoka-shi, Fukuoka, Japan
Filed Jul. 18, 1980, Ser. No. 170,246
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—36

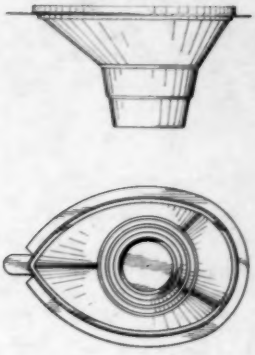
269,376
BACK MASSAGER
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, Tokyo; Kenshun Ishii, Tokyo, and Tetsumi Fujiyama, Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Oct. 27, 1980, Ser. No. 200,850
Claims priority, application Japan, Jun. 5, 1980, 55-22427
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—36



269,377
MASSAGING APPLIANCE
Frederick G. Mackay, Tarzana, Calif., and Keith M. Mullins, Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Fort Collins, Colo.
Filed Nov. 17, 1980, Ser. No. 207,450
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—41

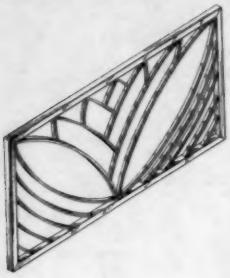


269,378
URINE SPECIMEN CONTAINER
Gerald Work, c/o Caelus Corp., 800 Fidelity Bldg., Spokane, Wash. 99201
Filed Aug. 29, 1980, Ser. No. 182,482
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—54

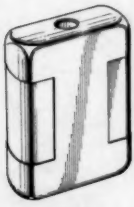


269,379
ARTICULATE KNEE BRACE
Gary R. Bledsoe, Arlington, Tex., assignor to Medical Designs, Inc., Arlington, Tex.
Filed Jan. 2, 1981, Ser. No. 222,027
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—64

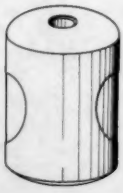
269,380
WINDOW SECURITY GRATING
Thomas G. d'Avila, P.O. Box 9246, Denver, Colo. 80203
Filed Aug. 25, 1980, Ser. No. 181,197
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—53



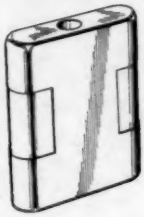
269,381
CIGAR AND CIGARETTE FILTER PERFORATOR
Rafael T. Cervantes, Malaga, Spain, assignor to The Westbury Foundation, Andorra and Sociedad de Dispositivos Reductores de Tabaco, S.A., Spain
Filed Jun. 29, 1981, Ser. No. 278,377
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—51



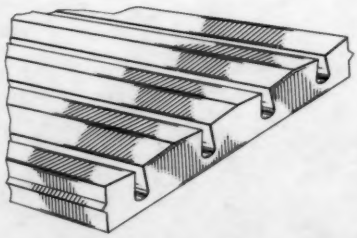
269,382
CIGAR AND CIGARETTE FILTER PERFORATOR
Rafael T. Cervantes, Malaga, Spain, assignor to The Westbury Foundation, Andorra and Sociedad de Dispositivos Reductores de Tabaco, S.A., Spain
Filed Jun. 29, 1981, Ser. No. 278,379
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—51



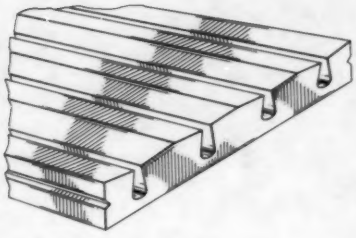
269,383
CIGAR AND CIGARETTE FILTER PERFORATOR
Rafael T. Cervantes, Malaga, Spain, assignor to The Westbury Foundation, Andorra and Sociedad de Dispositivos Reductores de Tabaco, S.A., Spain
Filed Jun. 29, 1981, Ser. No. 278,577
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—51



269,384
INTERLOCKING FLUME PLATFORM PANEL FOR ANIMAL CONFINEMENT PENS
Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85034
Filed May 26, 1981, Ser. No. 267,002
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2

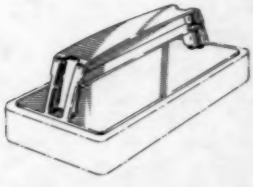


269,385
INTERLOCKING FLUME PLATFORM PANEL FOR ANIMAL CONFINEMENT PENS
Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85034
Filed May 26, 1981, Ser. No. 267,384
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2

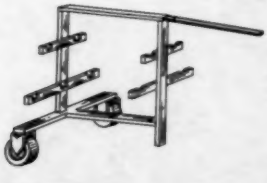


269,386
DISH FOR ANIMALS
George Khider, 129 Porterfield Pl., Freeport, N.Y. 11520
Filed May 7, 1981, Ser. No. 261,567
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16

269,387
HOLDER FOR A HAND SCRUBBER
Donald R. McClelland, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jun. 4, 1981, Ser. No. 270,251
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—52



269,388
WIRE HANDLING CART
Gary E. Smith, 3543 Norton Way, and Edward D. Parks, 7755 Fairoaks Dr., both of Pleasanton, Calif. 94566
Filed Dec. 24, 1980, Ser. No. 219,928
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—24



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF JUNE, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Aoki & Associates: *See*—
Saito, Seiichi; and Kitano, Yuji, 4,388,725, Cl. 375-36.000.

A & H Mfg. Co.: *See*—
Kortick, Morris, 4,387,641, Cl. 101-27.000.

A-Lok Products, Inc.: *See*—
Ditcher, Jack; and Westhoff, James A., 4,387,900, Cl. 277-101.000.

A.M.S. (Ateliers de Moulage Specialise): *See*—
Geiger, Reinold, 4,387,821, Cl. 215-330.000.

A/S Wittenborgs Automatfabriker: *See*—
Wittenborg, Poul E., 4,388,338, Cl. 426-590.000.

Abbestam, Kaj; and Palmers, Goran, to Institutet for Verkstadsteknisk Forskning. Machine tool. 4,387,635, Cl. 100-214.000.

Abbey, Harold G. Fluidic control system including variable venturi. 4,387,685, Cl. 123-439.000.

Abbott Laboratories: *See*—
Seberg, Charles H.; and Harms, Jack L., 4,388,074, Cl. 604-165.000.

Abdalla, Lawrence H. Egyptian hair dryer: 4,387,729, Cl. 132-33.00R.

Abe, Masaharu: *See*—
Oizumi, Masayuki; Abe, Masaharu; and Fushiki, Yasuo, 4,388,129, Cl. 156-73.100.

Abe, Mitsunobu: *See*—
Oguri, Yasuo; Awata, Mitsuru; and Abe, Mitsunobu, 4,388,257, Cl. 264-82.000.

Abrams, Jack Z.; and Sherwin, Robert M., to Bechtel International Corporation. SO_2 removal. 4,388,283, Cl. 423-242.000.

Acimovic, Simeon; Lindemann, Karl-Heinz; and Kunz, Volker G., to Elektro-Brite GmbH & Co. KG. Acid tin bath and tin/lead bath respectively for the e!ectrode-position of lustrous coatings of tin and tin/lead respectively. 4,388,161, Cl. 204-43.00S.

Adcock, Gerald L. Well case driving anvil. 4,387,776, Cl. 175-293.000.

Adickes, Henning, to Deere & Company. Exhaust system pipe and exhaust system with such a pipe. 4,387,915, Cl. 285-330.000.

Adolfsson, Ebbe S.; Andersson, Kurt H.; and Ekwall, Carl G. B., to Atlas Copco Aktiebolag. Rock drilling apparatus. 4,387,775, Cl. 175-135.000.

Adrian, Ronald J., to TSI Incorporated. Particle size measuring method and apparatus. 4,387,993, Cl. 356-336.000.

Advanced Energy Systems Inc.: *See*—
Carman, Vincent E., 4,387,783, Cl. 180-165.000.

Advanced Products Beer-Sheva Ltd.: *See*—
Nathan, Roger H., 4,387,876, Cl. 248-571.000.

Advanced Technology Laboratories, Inc.: *See*—
Brandestini, Marco A., 4,387,597, Cl. 73-626.000.

Advanced Terminals, Inc.: *See*—
Greene, Jay R.; Windecker, James W., Jr.; Roberts, James H.; and Wood, Harold F., 4,388,008, Cl. 400-578.000.

AEL Microtel Limited: *See*—
Lumsden, James R., 4,388,690, Cl. 364-483.000.

Agence Nationale de Valorisation de la Recherche - A.N.V.A.R.: *See*—
Guimbal, Jean, 4,388,543, Cl. 310-13.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Helling, Gunter; Reiff, Helmut; Himmelmann, Wolfgang; and Renner, Gunter, 4,388,403, Cl. 430-546.000.

Agnes, Jennifer M.: *See*—
Maurice, Terrence J.; Murray, Edward D.; and Agnes, Jennifer M., 4,388,333, Cl. 426-104.000.

Ahrens, James E. Sign holder. 4,387,520, Cl. 40-16.600.

Ahroni, Joseph M. Fused plug assembly with push-in fuse unit. 4,388,604, Cl. 337-197.000.

Ahuja, Omprakash G., to TII Industries Inc. Audio-visual line test termination device. 4,388,501, Cl. 179-175.30R.

Aichelmann, Frederick J., Jr.; and Neves, Fernando, to International Business Machines Corp. Recirculating loop memory array having a shift register buffer for parallel fetching and storing. 4,388,701, Cl. 365-77.000.

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Hori, Takanobu; Arai, Fuminao; Kodama, Hisashi; and Okabe, Yoshio, 4,387,675, Cl. 123-90.580.
Katagiri, Masayoshi; and Ogura, Osamu, 4,387,625, Cl. 91-369.00B.
Yogo, Kenji; and Nomura, Isshi, 4,387,696, Cl. 123-585.000.

Aisin Warner Kabushiki Kaisha: *See*—
Sakakibara, Shiro, 4,387,607, Cl. 74-781.00R.

Aizawa, Hiroshi: *See*—
Uchidoi, Masanori; Aizawa, Hiroshi; Urushihara, Kazunobu; Suzuki, Nobuyuki; and Shimizu, Masami, 4,387,977, Cl. 354-60.00R.

Aizawa, Masuo: *See*—
Suzuki, Shuichi; Aizawa, Masuo; Koyama, Masao; Sato, Yuichi; and Koezuka, Junji, 4,388,166, Cl. 204-403.000.

Aizawa, Tatsuo: *See*—
Nishibayashi, Hatsumi; Amagai, Yoshimi; Hikake, Norio; Kouchi, Toshihiro; and Aizawa, Tatsuo, 4,388,396, Cl. 430-126.000.

Ajinomoto Company Incorporated: *See*—
Sano, Kounosuke; and Tsuchida, Takayasu, 4,388,405, Cl. 435-107.000.

Akashi, Goro: *See*—
Hibino, Noburo; and Akashi, Goro, 4,388,368, Cl. 428-336.000.
Miyoshi, Takahito; Okutu, Toshimitu; Takimoto, Masaaki; Saida, Takashi; Akashi, Goro; and Fujiyama, Masaaki, 4,388,360, Cl. 428-172.000.

Akita, Shinji; and Hatanaka, Masayuki, to Nippon Kokan Kabushiki Kaisha. Steel pipe rolling mill. 4,387,584, Cl. 72-100.000.

Akita, Yasuhiro: *See*—
Takemura, Yozo; Kobayashi, Isao; Akita, Yasuhiro; and Kato, Kaoru, 4,388,113, Cl. 75-51.000.

Aktiebolaget Bofors: *See*—
Bjurstrom, Lennart, 4,387,624, Cl. 89-41.0LE.

Akzona, Incorporated: *See*—
Bachmann, Adolf; Boehler, Joachim; and Linhart, Heinz, 4,388,057, Cl. 425-97.000.

Alexander, William J., III. Swatch remover and method. 4,387,590, Cl. 73-159.000.

Alfa-Laval AB: *See*—
Kristoffersson, Ingmar, 4,387,765, Cl. 165-166.000.

Alheid, Robert J., to Beloit Corporation. Blade type fountain coater metering device. 4,387,663, Cl. 118-413.000.

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Allegretti & Co.: *See*—
Mattson, Charles A.; Michel, James; and Domagalski, Anthony, 4,387,852, Cl. 239-143.000.

Allen, John H., to United States of America, Navy. Data buffer circuit. 4,388,698, Cl. 364-900.000.

Allied Corporation: *See*—
Bustany, Samir T., 4,387,698, Cl. 125-18.000.

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Uroshevich, Miroslav, 4,388,481, Cl. 136-246.000.

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Gillet, Roger, 4,388,544, Cl. 310-71.000.

Alwani, Dru W.: *See*—
Hort, Eugene V.; Anderson, Lowell R.; and Alwani, Dru W., 4,388,206, Cl. 252-148.000.

Amagai, Yoshimi: *See*—
Nishibayashi, Hatsumi; Amagai, Yoshimi; Hikake, Norio; Kouchi, Toshihiro; and Aizawa, Tatsuo, 4,388,396, Cl. 430-126.000.

Amantea, Robert; and Wheatley, Carl F., Jr., to RCA Corporation. Transistor with improved second breakdown capability. 4,388,634, Cl. 357-34.000.

American Cyanamid Company: *See*—
Shepherd, Robert G., 4,388,459, Cl. 542-427.000.

American Hoechst Corporation: *See*—
Gillich, Thomas N.; and Walls, John E., 4,388,156, Cl. 204-14.00N.
Hopper, Michael J.; Martin, Michael R.; Bolt, Lawrence; Smith, Michael; and Tavasolian, Ali, 4,388,375, Cl. 428-423.700.

American Hospital Supply Corporation: *See*—
Borsanyi, Alexander S., 4,387,734, Cl. 137-206.000.

American Schack Company, Inc.: *See*—
Natarajan, Cuddalore P.; and Meder, Siegfried R., 4,388,066, Cl. 432-1.000.

Amerock Corporation: *See*—
Lense, Robert F., 4,387,942, Cl. 312-334.000.

Aminetzah, Yehuda J., to Northern Telecom Limited. Method of controlling scrambling and unscrambling in a pay TV system. 4,388,643, Cl. 358-123.000.

Ammons, William S.: *See*—
Koyama, Shozo; Manning, John W., Jr.; Ammons, William S.; and Santiesteban, Hector L., 4,388,318, Cl. 424-251.000.

AMP Incorporated: *See*—
Dechelette, Helen, 4,387,509, Cl. 29-850.000.
Lannan, Patrick E., 4,388,591, Cl. 324-158.00P.
Rix, Robert D., 4,387,501, Cl. 29-566.400.
Sergeant, Ronald G., 4,387,610, Cl. 81-5.10R.

Andersen, Cyril F. Game apparatus. 4,387,897, Cl. 273-276.000.

Anderson, George R.: *See*—
Yong, Samuel H.; Anderson, George R.; and Levin, Liza, 4,388,336, Cl. 426-551.000.

Anderson, John C. R.: *See*—
Soltysik, George E.; and Anderson, John C. R., 4,388,719, Cl. 371-27.000.

Anderson, Lowell R.: *See—*
Hort, Eugese V.; Anderson, Lowell R.; and Alwani, Dru W., 4,388,206, Cl. 252-148.000.

Anderson, Ronald L.: *See—*
Fields, Ellis K.; and Anderson, Ronald L., 4,388,470, Cl. 549-240.000.

Andersson, Kurt H.: *See—*
Adolfsson, Ebbe S.; Andersson, Kurt H.; and Ekwall, Carl G. B., 4,387,775, Cl. 175-135.000.

Andreev, Jury M.: *See—*
Shipaev, Gennady A.; Seliverstov, Vyacheslav V.; Osipov, Nikolai A.; Prolygin, Anatoly P.; Mashikhin, Anatoly D.; Askinazi, Mikhail P.; Andreev, Jury M.; and Kagan, Samuil I., 4,388,569, Cl. 318-87.000.

Andrienko, Petr D.: *See—*
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.

Anelva Corporation: *See—*
Takahashi, Nobuyuki, 4,388,034, Cl. 414-331.000.

Annovi, Giuseppe, to Dolomite S.p.A. Ski boot with removable fastening straps. 4,387,517, Cl. 36-117.000.

Anokhin, Felix A. Electrophotographic method for producing an image on dielectric film using ion generation. 4,388,390, Cl. 430-48.000.

Antson, Jorma O.: *See—*
Suntola, Tuomo; and Antson, Jorma O., 4,388,554, Cl. 313-505.000.

Aoike, Nanjou: *See—*
Koshimura, Yasunobu; Kobayashi, Hisao; and Aoike, Nanjou, 4,388,561, Cl. 315-171.000.

Aoki, Fukuichi: *See—*
Kudoh, Akihide; Kawamata, Motoo; Ohshima, Kazushi; Kotzai, Makoto; Tsuda, Takeshi; and Aoki, Fukuichi, 4,388,478, Cl. 568-804.000.

Aoki, Ichizo: *See—*
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Aoki, Masakazu: *See—*
Koike, Norio; Sasano, Akira; Taniguchi, Yoshio; Nakano, Toshio; Aoki, Masakazu; and Takemoto, Iwao, 4,387,987, Cl. 355-133.000.

Aoyama, Shunichi; and Murata, Eiji, to Nissan Motor Co., Ltd.; and Nissan Motor Co., Ltd. Valve opening control device. 4,387,673, Cl. 123-90.160.

Aoyama, Takashi: *See—*
Suzuki, Takaya; Inoue, Yosuke; and Aoyama, Takashi, 4,388,342, Cl. 427-8.000.

Ap, Ngy S.: *See—*
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Arai, Fuminao: *See—*
Hori, Takanobu; Arai, Fuminao; Kodama, Hisashi; and Okabe, Yoshio, 4,387,675, Cl. 123-90.580.

Arai, Yasunori: *See—*
Ohishi, Michiro; Ogawa, Ryota; and Arai, Yasunori, 4,387,979, Cl. 355-3.00R.

Arakawa, Satoshi, to Mitsubishi Gas Chemical Co., Inc. Process for the production of dithionites. 4,388,291, Cl. 423-515.000.

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Arbed S.A.: *See—*
Metz, Paul, 4,387,761, Cl. 164-437.000.

Arcair Company: *See—*
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Armstrong, Errol C.: *See—*
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Arrazola, Ignacio M.; Brown, Raymond E.; and Dillard, Homer E., to McDonnell Douglas Corporation. Electron addressed liquid crystal light valve. 4,387,964, Cl. 350-331.00R.

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Shipaev, Gennady A.; Seliverstov, Vyacheslav V.; Osipov, Nikolai A.; Prolygin, Anatoly P.; Mashikhin, Anatoly D.; Askinazi, Mikhail P.; Andreev, Jury M.; and Kagan, Samuil I., 4,388,569, Cl. 318-87.000.

Associated Engineering France, S.A.: *See—*
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Astec Components, Ltd.: *See—*
Josephson, Elliot, 4,388,562, Cl. 315-205.000.

Aswell, Cecil J.; and Chapman, Hugh N., to Mostek Corporation. Method for programming circuit elements in integrated circuits. 4,387,503, Cl. 29-575.000.

Atari, Inc.: *See—*
Sherman, David L., 4,388,620, Cl. 340-744.000.

Atlantic Richfield Company: *See—*
Bourland, Larry G., 4,388,443, Cl. 525-67.000.
Kapur, Vijay K.; and Khanna, Ashok K., 4,388,080, Cl. 23-293.00R.
Kapur, Vijay K.; and Choudary, Uppala V., 4,388,286, Cl. 423-348.000.

Atlas Copco Aktiebolag: *See—*
Adolfsson, Ebbe S.; Andersson, Kurt H.; and Ekwall, Carl G. B., 4,387,775, Cl. 175-135.000.

Atlee, John L., III; and Fiore, Maximillian D., to Wisconsin Alumni Research Foundation. Method and apparatus for determining the level of neuromuscular block in a patient. 4,387,723, Cl. 128-734.000.

Audi NSU Auto Union AG: *See—*
Bois, Wilhelm; and Buchl, Josef, 4,388,574, Cl. 318-443.000.

Aulabaugh, Ann E.: *See—*
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Austin, John J., to Champion International Corporation. Convertible pill cup package. 4,387,804, Cl. 206-218.000.

Automated Packaging Systems, Inc.: *See—*
Lerner, Bernard, 4,387,550, Cl. 53-459.000.

Automatic Material Handling, Inc.: *See—*
Keller, Alex J.; Williams, Joseph R.; Fechner, Erhard A.; and Pinto, Akiva, 4,387,486, Cl. 19-105.000.

Automatic Switch Company: *See—*
Wiktor, Dominik M.; and Schlindwein, Siegfried, 4,388,535, Cl. 307-113.000.

Avezou, Jean-Claude, to Associated Engineering France, S.A. Piston ring groove reinforcement. 4,387,627, Cl. 92-222.000.

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Bockno, Gregory C., 4,388,260, Cl. 264-168.000.

Awata, Mitsuru: *See—*
Oguri, Yasuo; Awata, Mitsuru; and Abe, Mitsunobu, 4,388,257, Cl. 264-82.000.

Awazuhara, Hiroshi; Tsumura, Sukebumi; and Kimura, Tomoaki, to Hitachi, Ltd. Method of widthwise rolling of rolled material and apparatus therefor. 4,387,586, Cl. 72-206.000.

Ayers, Anne L. Process for decorating articles. 4,388,350, Cl. 427-262.000.

Azar, Jack C.: *See—*
Rourke, John L.; Azar, Jack C.; and Murphy, William K., 4,388,274, Cl. 422-177.000.

Azegami, Tadashi, to Hokushin Electric Works, Ltd. Capacitance type displacement conversion device. 4,387,601, Cl. 73-724.000.

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Nagira, Norichika; Ikegami, Hiroshi; Baba, Hiroji; and Yahano, Kanji, 4,388,169, Cl. 204-207.000.

Babcock Power Limited: *See—*
Campbell, John W. E., 4,387,577, Cl. 60-680.000.

Babcock & Wilcox Company, The: *See—*
Berthold, John, 4,387,594, Cl. 73-293.000.
Larson, Jeffrey G., 4,388,269, Cl. 376-442.000.
Nuspl, Steven P., 4,388,691, Cl. 364-510.000.
Sangree, Neal V., 4,388,570, Cl. 318-255.000.

Bache, Ronald R.: *See—*
Shearing, Scott J. G.; and Bache, Ronald R., 4,387,802, Cl. 206-45.000.

Bachmann, Adolf; Boehler, Joachim; and Linhart, Heinz, to Akzona, Incorporated. Device for the continuous application of liquid finish to a spinneret. 4,388,057, Cl. 425-97.000.

Bachmann, Klaus J.; Lewerenz, Hans-Joachim; and Menezes, Maria T. A. S., to Bell Telephone Laboratories, Incorporated. Photoelectrochemical cells. 4,388,382, Cl. 429-111.000.

Badger Northland, Inc.: *See—*
Sweeney, Raymond G.; and Rammer, William L., 4,387,799, Cl. 198-735.000.

Baer, John R.: *See—*
Mangels, John A.; and Baer, John R., 4,388,414, Cl. 501-98.000.

Bahr, James T., to Rhone-Poulenc Agrochimie. Herbicidal cyclic sulfonamides of phenoxybenzoic acids. 4,388,105, Cl. 71-91.000.

Bailey, David C.: *See—*
Dukes, Allen E.; and Bailey, David C., 4,388,652, Cl. 358-285.000.

Baird, Leonard B. Container crushing device. 4,387,637, Cl. 100-264.000.

Balakrishnan, Ramanatha V., to National Semiconductor Corporation. Bubble memory sense amplifier. 4,388,699, Cl. 365-8.000.

Balass, Valentin, to Bucher-Buyer AG. Diaphragm press for agricultural products, such as grapes, fruits and other fruit-like products. 4,387,634, Cl. 100-211.000.

Balasubramanian, N. Optical system for surface topography measurement. 4,387,994, Cl. 356-360.000.

Balazs, Les; and Winiasz, Michael E., to Clark Reliance Corp., The. Dual fulcrum steam trap. 4,387,733, Cl. 137-185.000.

Baldwin, Dan D., to Nautilus Sports/Medical Industries, Inc. Abdominal weight lifting apparatus. 4,387,893, Cl. 272-118.000.

Baldwin, Darwin E. Bowling shoe protector. 4,387,515, Cl. 36-7.500.

Baldwin Piano & Organ Company: *See*—
Kimble, Thomas E., 4,387,623, Cl. 84-179.000.
Simmons, Carlton J., Jr., 4,387,618, Cl. 84-1.030.

Bales, Stephen E., to Dow Chemical Company, The. Process for preparing ester carbonate copolymers. 4,388,455, Cl. 528-176.000.

Balestrino, Giovanni: *See*—
Ferrero, Mario; and Balestrino, Giovanni, 4,388,516, Cl. 219-119.000.

Ballantyne, James. Sludge processing system. 4,387,633, Cl. 100-48.000.

Ballato, Arthur, to United States of America, Army. Analog correction of quartz resonator angle of cut. 4,388,146, Cl. 156-626.000.

Balzers Aktiengesellschaft: *See*—
Moll, Eberhard; and Lardon, Marcel, 4,388,164, Cl. 204-192.0SP.

Bandoh, Kazuo. Process and apparatus for molding plastics. 4,388,265, Cl. 264-297.200.

Bandura, Vitaly: *See*—
Wright, Henry L.; Bandura, Vitaly; and Woodman, Daniel W., Jr., 4,387,506, Cl. 29-714.000.

Barbee, Robert B.; and Minnick, Larry A., to Eastman Kodak Company. Copolyesters having improved gas barrier properties. 4,388,456, Cl. 528-289.000.

Barker, Joel A.; and Birch, Jeffrey, to J. B. Two Corporation. Bicycle seat. 4,387,925, Cl. 297-201.000.

Barker, Michael D.: *See*—
Powell, James E.; and Barker, Michael D., 4,388,104, Cl. 71-88.000.

Barking, Hans: *See*—
Brunner, Karl; Barking, Hans; and Didschies, Gunter, 4,388,127, Cl. 156-53.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Lorenz, Hellmut, 4,387,557, Cl. 57-340.000.

Barry, George H.: *See*—
Dahl, Ernest A.; and Barry, George H., 4,388,584, Cl. 320-48.000.

Bartel, Gunter; Patz, Eckhard; Koch, Karl; Stern, Georg; Stotz, Manfred; and Triffterer, Adolf, to Daimler-Benz Aktiengesellschaft. Fuel feed pump. 4,388,053, Cl. 417-542.000.

Barthold, Klaus: *See*—
Oppenlaender, Knut; Stork, Karl; and Barthold, Klaus, 4,388,213, Cl. 252-392.000.
Oppenlaender, Knut; Stork, Karl; and Barthold, Klaus, 4,388,214, Cl. 252-392.000.

Bartok, William; Song, Yih H.; Siminski, Vince J.; and Longwell, John P., to Exxon Research and Engineering Co. Multi-stage process for combusting fuels containing fixed-nitrogen species. 4,388,062, Cl. 431-10.000.

BASF Aktiengesellschaft: *See*—
Hochstein, Waldheim; Kaibel, Gerd; Mueller, Franz-Josef; and Hartmann, Horst, 4,388,154, Cl. 203-35.000.
Loch, Werner, 4,388,435, Cl. 524-548.000.
Oppenlaender, Knut; Stork, Karl; and Barthold, Klaus, 4,388,213, Cl. 252-392.000.
Oppenlaender, Knut; Stork, Karl; and Barthold, Klaus, 4,388,214, Cl. 252-392.000.
Steiner, Gerd; Franke, Albrecht; Lenke, Dieter; Teschendorf, Hans-Juegen; Worstmann, Wolfgang; and Kreiskott, Horst, 4,388,237, Cl. 260-239.0BC.
Strehler, Hugo; Hoerauf, Werner; and Valentin, Guenter, 4,388,425, Cl. 523-333.000.

BASF Wyandotte Corporation: *See*—
McBrayer, Robert L., 4,388,420, Cl. 521-127.000.

Basol, Bulent M.; Tseng, Eric S.; and Rod, Robert L., to Monosolar, Inc. Thin film heterojunction photovoltaic cells and methods of making the same. 4,388,483, Cl. 136-260.000.

Batelson, Per G.: *See*—
Sunden, Olof; Batelson, Per G.; Johansson, Hans E.; Larsson, Hans M.; and Svending, Per J., 4,388,150, Cl. 162-175.000.

Batey, Robert W.: *See*—
Schiffmann, Robert F.; Mirman, Alfred H.; Grillo, Richard J.; and Batey, Robert W., 4,388,335, Cl. 426-243.000.

Bauer, Heinz; and Herter, Kurt, to Bauer-Kompressoren GmbH. Interchangeable and disposable filter cartridge and method of removing moisture and oil from compressed breathable air. 4,388,086, Cl. 55-75.000.

Bauer-Kompressoren GmbH: *See*—
Bauer, Heinz; and Herter, Kurt, 4,388,086, Cl. 55-75.000.

Baumann, Rene, to Wiba AG. Bench-type exerciser device. 4,387,894, Cl. 272-130.000.

Baumann, Robert P.; Blais, Marcel; and Spiess, Irwin, to United States of America, Army. Use of ultrasonic energy to improve nitrocellulose purification. 4,388,458, Cl. 536-38.000.

Bautze, F. Jeffery. Method of producing a package for display and handling of foil art. 4,388,130, Cl. 156-85.000.

Baxter Travenol Laboratories, Inc.: *See*—
Pavlo, John A.; and Stauber, Ronald C., 4,387,873, Cl. 248-226.400.

Bayer Aktiengesellschaft: *See*—
Bueb, Michael; Bruck, Robert; Muschelknautz, Edgar; Paulini, Dieter; and Feltgen, Karlheinz, 4,387,476, Cl. 8-151.200.
Elbe, Hans-Ludwig; Arold, Hermann; Kranz, Eckart; and Stolzer, Claus, 4,388,465, Cl. 548-262.000.
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; and Stendel, Wilhelm, 4,388,322, Cl. 424-304.000.
Heitkamper, Peter; Konig, Klaus; Faust, Rudolf; and Findeisen, Kurt, 4,388,238, Cl. 260-239.00E.
Jonas, Gerhard, 4,388,290, Cl. 423-468.000.
Sundermann, Rudolf; Konig, Klaus; Engbert, Theodor; Becker, Gernot; and Hammen, Gunther, 4,388,246, Cl. 260-453.00P.

BBC Brown, Boveri & Co. Ltd.: *See*—
Bellati, Hans, 4,388,004, Cl. 384-397.000.

Beasley, J. Donald, to Gould Inc. Method for fabricating an optical waveguide evanescent wave coupler having an interleaved film. 4,387,954, Cl. 350-96.150.

Beatty, John C., III. Ventilated cast structure and method of producing the same. 4,387,710, Cl. 128-91.00R.

Bebok, Janos B., to Macro Engineering Company Ltd. Guide assembly for cylindrical plastic tubes. 4,388,061, Cl. 425-392.000.

Becella, Peter, to Konig-Electronic Friedrich W. Konig. Cleaning cassette for a tape machine. 4,388,663, Cl. 360-128.000.

Bechtel International Corporation: *See*—
Abrams, Jack Z.; and Sherwin, Robert M., 4,388,283, Cl. 423-242.000.

Beck, Bernhard: *See*—
Fratzer, Gerhard; Beck, Bernhard; Dold, Erwin; and Klebe, Hans, 4,388,275, Cl. 422-180.000.

Beck, Vernon D., to International Business Machines Corporation. Corrector for bundle deflection distortion in multibeam cathode ray tubes. 4,388,619, Cl. 340-727.000.

Becker, Bernard; Meyer-Pittroff, Roland; and Frohlich, Gunter, to Kraftwerk Union Aktiengesellschaft. Solar power plant including a solar heater on a tower. 4,387,574, Cl. 60-641.110.

Becker, Gernot: *See*—
Sundermann, Rudolf; Konig, Klaus; Engbert, Theodor; Becker, Gernot; and Hammen, Gunther, 4,388,246, Cl. 260-453.00P.

Becton, Dickinson and Company: *See*—
Lynn, Robert W., 4,387,822, Cl. 215-330.000.

Bedard, James F.; Eichelberger, Charles W.; and Chen, De-Yu, to General Electric Company. Passive control network for remote control of load output level. 4,388,566, Cl. 315-291.000.

Bedogni, Erminio. Cutter bar. 4,387,554, Cl. 56-296.000.

Beduhn, Daniel E.; and Morrow, James G., Sr., to Manitowoc Company, Inc., The. Movable ring supported lift crane. 4,387,813, Cl. 212-195.000.

Beduhn, Daniel E.; and Morrow, James G., Sr., to Manitowoc Company, Inc., The. Traveling attachment for ring supported lift crane. 4,387,814, Cl. 212-195.000.

Beecham Group Limited: *See*—
Harbridge, John B., 4,388,300, Cl. 424-114.000.

Beifuss, Wolfgang; Birzele, Paul; and Geitz, Gerhard, to Siemens Aktiengesellschaft. Data transmission/receiving device having parallel/-serial and serial parallel character conversion, particularly for data exchange between communicating data processing systems. 4,388,683, Cl. 364-200.000.

Beisel, Hermann: *See*—
Jeschke, Willi; Junghans, Rudi; Beisel, Hermann; and Hofmann, Gunther, 4,387,648, Cl. 101-365.000.

Beizinger, Kurt: *See*—
Rehm, Siegfried; and Beizinger, Kurt, 4,387,558, Cl. 57-408.000.

Bell, Albert H., III, to General Motors Corporation. Articulated power turbine gate. 4,387,563, Cl. 60-39.250.

Bell, Robert L.; Willing, Robert; and Kavli, Fred, to Kaylico Corporation. Capacitive pressure transducer. 4,388,668, Cl. 361-283.000.

Bell Telephone Laboratories, Incorporated: *See*—
Bachmann, Klaus J.; Lewerenz, Hans-Joachim; and Menezes, Maria T. A. S., 4,388,382, Cl. 429-111.000.
Breen, Robert N.; and Goldenberg, Henry R., 4,388,697, Cl. 364-900.000.
Brooks, Grant P., 4,388,595, Cl. 329-104.000.
Gans, Michael J., 4,388,626, Cl. 343-854.000.
Heller, Adam, 4,388,383, Cl. 429-111.000.
Nash, Donald H.; and Yen, Duen H., 4,388,730, Cl. 455-208.000.
Pecon, Joseph A., Jr., 4,388,710, Cl. 367-134.000.
Silfvast, William T.; Szeto, Leo H.; and Wood, Obert R., II, 4,388,720, Cl. 372-76.000.

Bellati, Hans, to BBC Brown, Boveri & Co. Ltd. Shaft bearing arrangement. 4,388,004, Cl. 384-397.000.

Beloit Corporation: *See*—
Alheid, Robert J., 4,387,663, Cl. 118-413.000.

Belon, Paul: *See*—
Derrien, Jean-Yves; and Belon, Paul, 4,388,226, Cl. 252-470.000.

Belosljudova, Tamara M.: *See*—
Gryaznov, Vladimir M.; Karavanov, Andrei N.; Belosljudova, Tamara M.; Ermolaev, Anatoly V.; Maganjuk, Anatoly P.; and Sarycheva, Irina K., 4,388,479, Cl. 568-828.000.

Bendix Corporation, The: *See*—
Frear, David L., 4,387,944, Cl. 339-59.00R.
Lao, Binneg Y., 4,387,602, Cl. 73-861.090.
MacAvoy, David W., 4,387,945, Cl. 339-59.00R.
Myers, Lawrence R., 4,387,626, Cl. 91-376.00R.
Reed, Chester L.; and Bridges, Robert M., 4,388,709, Cl. 367-131.000.
Ritsema, Irving R., 4,387,791, Cl. 188-77.00R.

Ritsema, Irving R., 4,387,901, Cl. 277-165.000.
Werth, Dee A.; Schildkraut, Alan L.; and MacAvoy, David W., 4,387,943, Cl. 339-59.00R.
Benn, Raymond C., to International Nickel Company, Inc., The. Carburization resistant high temperature alloy. 4,388,125, Cl. 148-428.000.
Bensman, Richard W., to Champion Spark Plug Company. Plasma plug. 4,388,549, Cl. 313-138.000.
Benson, Gregory R.: *See*—
Kaufman, Edward R.; Benson, Gregory R.; and Shaines, Alfred, 4,388,423, Cl. 523-153.000.
Benton, Ronald, to Honeywell Inc. Multistage thermostat using multirate integral action and exponential setpoint change. 4,387,763, Cl. 165-29.000.
Benz, Bernard D.: *See*—
Schwartz, Vern R.; and Benz, Bernard D., 4,387,499, Cl. 29-564.600.
Berchowitz, David M., to Mechanical Technology Incorporated. Independently variable phase and stroke control for a double acting Stirling engine. 4,387,566, Cl. 60-518.000.
Berger, Leo; and Olson, Gary L., to Hoffmann-La Roche Inc. Cycloalka[4,5]pyrrolo[2,3-g]isoquinolines. 4,388,467, Cl. 548-439.000.
Bergheim, Hans; and Griep, Winfried, to Vaw Leichtmetall GmbH. Pipe connection and method for production. 4,388,013, Cl. 403-277.000.
Berlenbach, Norbert: *See*—
von Hagel, Gunter; Berlenbach, Norbert; and Werner, Gerhard, 4,388,195, Cl. 210-709.000.
Bernard, Patrice. Vehicle location monitoring system. 4,388,608, Cl. 340-24.000.
Berry, Richard C., to Cooper Industries, Inc. Combination breather-drain. 4,387,829, Cl. 220-374.000.
Berthold, John, to Babcock & Wilcox Company, The. Water level indicator having a remote and a local readout display. 4,387,594, Cl. 73-293.000.
Bertin, Claude L.; Kotecha, Harish N.; and Wiedman, Francis W., to International Business Machines Corporation. Non-volatile RAM cell with enhanced conduction insulators. 4,388,704, Cl. 365-154.000.
Bertolini, Natale: *See*—
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Bey, Philippe; and Jung, Michel, to Merrell Toraude et Compagnie. α-Halomethyl derivatives of amino acids. 4,388,466, Cl. 548-337.000.
Bhatnagar, Har S., to General Electric Company. Dynamoelectric machine. 4,388,581, Cl. 318-789.000.
Bi-Modal Corporation, The: *See*—
Cripe, Christopher A., 4,387,933, Cl. 303-22.00A.
Bianchi, Alberta: *See*—
Nannini, Giuliano; Perrone, Ettore; Severino, Dino; Meinardi, Giuseppe; Monti, Gisella; Bianchi, Alberta; Forgione, Angelo; and Confalonieri, Carlo, 4,388,314, Cl. 424-246.000.
Bickler, Donald B.: *See*—
United States of America, National Aeronautics and Space Administration; and Bickler, Donald B., 4,388,346, Cl. 427-58.000.
Bickley, Robert H.; and Hunt, Albert H., to Motorola Inc. Frequency synthesizer having plural phase locked loops. 4,388,597, Cl. 331-2.000.
Bilitz, Mark R.; and Dickson, Dale A., to Medtronic, Inc. Control cover for nerve stimulator. 4,387,718, Cl. 128-419.00R.
Biller, Cleveland J.; and Johnson, David D., to United States of America, Agriculture. Intermediate cable support. 4,387,812, Cl. 212-176.000.
Billhartz, Larry E., to Siemens-Allis, Inc. Bypass and meter release for watthour meter socket. 4,388,670, Cl. 361-367.000.
Binasik, Chester S.; and Siegert, Louis D., to Coen Company, Inc. Method for firing a rotary kiln with pulverized solid fuel. 4,387,654, Cl. 110-347.000.
Biosearch Medical Products Inc.: *See*—
Waters, William E., 4,388,076, Cl. 604-165.000.
Birch, Jeffrey: *See*—
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Birkert, Rolf: *See*—
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Birkett, Sydney: *See*—
Ford, Barry S.; and Birkett, Sydney, 4,388,615, Cl. 340-516.000.
Birzele, Paul: *See*—
Beifuss, Wolfgang; Birzele, Paul; and Geitz, Gerhard, 4,388,683, Cl. 364-200.000.
Bishop, Thomas G., to HPM Corporation. Combination thermoplastic and glass loaded thermosetting injection molding machine and method for operating same. 4,387,834, Cl. 222-278.000.
Bishop, Thomas R.; Chancey, Roger D.; and Kovar, Wayne A., to Bowen Tools, Inc. Shock absorber assembly for absorbing shocks encountered by a drill string. 4,387,885, Cl. 267-125.000.
Bisonaya, Rudy Y.; and Farrell, Gerald J., to Elkay Manufacturing Company. Spread center faucet. 4,387,738, Cl. 137-801.000.
Bissell, Eugene R.; Mitchell, Alexander R.; Pearson, Karen W.; and Smith, Robert E., to University of California, The Regents of the. Synthetic substrates for enzyme analysis. 4,388,233, Cl. 260-112.50R.
Bissell, Lawrence E. Two-phase thermal energy conversion system. 4,387,576, Cl. 60-649.000.
Bjurstrom, Lennart, to Aktiebolaget Bofors. Device for increasing the tracking accuracy of an aiming system. 4,387,624, Cl. 89-41.0LE.
Black & Decker Inc.: *See*—
Saar, David A.; Walter, Richard T.; and Bowman, John L., Jr., 4,388,582, Cl. 320-20.000.
Black, Jerry G.: *See*—
Hawkins, William G.; and Black, Jerry G., 4,388,145, Cl. 156-617.00R.
Blackburn, Neil P.; Piper, Alfred E. C.; and Meeks, Alan M. G., to ITW Limited. Buckles. 4,387,490, Cl. 24-200.000.
Blackschleger, Douglas H. Petroleum preheating device for engines. 4,387,692, Cl. 123-557.000.
Blaimschein, Gottfried, to GFM Gesellschaft fur Fertigungstechnik und Mashinenbau Gesellschaft m.b.H. Process for milling long workpieces. 4,388,027, Cl. 409-131.000.
Blair, Bruce A., to Lenco, Inc. Video signal monitoring device and method. 4,388,637, Cl. 358-10.000.
Blair, Daniel R.: *See*—
Lomneth, Richard B.; Blair, Daniel R.; Parnell, Gary L.; and Tao, Bernard Y., 4,388,339, Cl. 426-602.000.
Blair, Gilbert; and Dusel, Martin C., to Dravo Corporation. Coke spillage removal device. 4,388,153, Cl. 202-248.000.
Blais, Marcel: *See*—
Baumann, Robert P.; Blais, Marcel; and Spiess, Irwin, 4,388,458, Cl. 536-38.000.
Blaisdell, Kenneth C. Engine lathe tail stock ram drive. 4,387,613, Cl. 82-31.000.
Blaisdell, Ronald G.; and Hough, Harold L., to GTE Products Corporation. Projection lighting unit with glass reflector capable of dual insertion. 4,388,679, Cl. 362-306.000.
Bland, William M., to Budd Company, The. Tire pressure control in a vehicle. 4,387,931, Cl. 303-1.000.
Blaschke, Felix; and Salzmann, Theodor, to Siemens Aktiengesellschaft. Rotating field machine drive. 4,388,577, Cl. 318-717.000.
Blatt, Leland F. Electric servo drive air cylinder. 4,388,576, Cl. 318-571.000.
Blaupunkt-Werke GmbH: *See*—
Timm, Horst, 4,388,712, Cl. 369-10.000.
Blendax-Werke R. Schneider GmbH & Co.: *See*—
Orlowski, Jan A., 4,388,069, Cl. 433-228.000.
Blessing, Hubert, to Levi Strauss & Co. Apparatus for fusing strips. 4,388,141, Cl. 156-432.000.
Block Drug Company, Inc.: *See*—
Kigyos, Frank, 4,387,479, Cl. 15-167.00R.
Board of Regents, University of Washington: *See*—
Allan, George G., 4,388,303, Cl. 424-162.000.
Allan, George G.; and Ko, Young C., 4,388,352, Cl. 427-391.000.
Boaz, Premakaran T., to Ford Motor Company. Electrically heated backlite structure. 4,388,522, Cl. 219-522.000.
Bock, Erich: *See*—
Studtmann, Rainer; and Bock, Erich, 4,387,556, Cl. 57-273.000.
Bockno, Gregory C., to Avtex Fibers Inc. Method of making viscose rayon. 4,388,260, Cl. 264-168.000.
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., to International Flavors & Fragrances Inc. Mixture of aliphatic C_{10} branched olefin epoxides and use thereof in augmenting or enhancing the aroma of perfumes and/or articles. 4,388,228, Cl. 252-522.00R.
Bodin, Michael L. Splash guard. 4,388,028, Cl. 409-136.000.
Boehler, Joachim: *See*—
Bachmann, Adolf; Boehler, Joachim; and Linhart, Heinz, 4,388,057, Cl. 425-97.000.
Boehringer Ingeleheim GmbH: *See*—
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Voss, Gunther; and Gruber, Peter, 4,388,343, Cl. 427-14.100.
Boehringer Ingelheim International GmbH: *See*—
Koyama, Shozo; Manning, John W., Jr.; Ammons, William S.; and Santiesteban, Hector L., 4,388,318, Cl. 424-251.000.
Boeing Aerospace Co. (A Division of the Boeing Company): *See*—
Simpson, Frederick H., 4,388,255, Cl. 264-29.100.
Boeing Company, The: *See*—
Skaale, Douglas E., 4,388,030, Cl. 410-69.000.
Boeke, Wouter M., to U.S. Philips Corporation. Integrated circuit comprising a plurality of voltage-current converters. 4,388,539, Cl. 307-491.000.
Boelitz, Martin V.: *See*—
Howard, Peter B.; Boelitz, Martin V.; and De Swarte, Thomas W., 4,387,865, Cl. 244-3.100.
Bogoljubov, Gennady D.: *See*—
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.
Bois, Wilhelm; and Buchl, Josef, to Audi NSU Auto Union AG. Control circuit for variable-speed windshield wiper. 4,388,574, Cl. 318-443.000.
Boisset, Bernard, to Societe Industrielle Bertrand Faure. Adjustable vehicle seats and their adjustment mechanisms. 4,387,874, Cl. 248-396.000.
Boitsov, Leonid I.: *See*—
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko,

Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.

Boldebuck, Edith M., deceased: *See*—
Bolon, Donald A.; and Boldebuck, Edith M., deceased, 4,388,371, Cl. 428-383.000.

Boliden Aktiebolag: *See*—
Jensfelt, Torsten E.; and Petersson, Stig A., 4,388,110, Cl. 75-21.000.

Boller, Edward, to Hydrovane Compressor Company Limited. Rotary compressors. 4,388,046, Cl. 417-295.000.

Bolon, Donald A.; and Boldebuck, Edith M., deceased (by Foster, Jeanette M., executrix), to General Electric Company. Self-bonding acrylic polymer overcoat for coated metal substrates. 4,388,371, Cl. 428-383.000.

Bolt, Lawrence: *See*—
Hopper, Michael J.; Martin, Michael R.; Bolt, Lawrence; Smith, Michael; and Tavasolian, Ali, 4,388,375, Cl. 428-423.700.

Bolton, Ross A. Device for extracting air from the interior of a structure. 4,387,629, Cl. 98-78.000.

Boms, Hermann: *See*—
Buchholz, Rainer; Mohn, Hans-Werner; Boms, Hermann; and Zodrow, Rudolf, 4,388,143, Cl. 156-475.000.

Bond, Gary M.: *See*—
Marshall, Albert H.; and Bond, Gary M., 4,387,974, Cl. 351-210.000.

Bonnet, Jean-Claude; and Pithouse, Kenneth B., to Raychem Limited. Silicone resin. 4,388,449, Cl. 525-477.000.

Boomershine, Norris L. Window assembly with magnetically attachable glazing panels. 4,387,541, Cl. 52-202.000.

Bordon, Daniel: *See*—
Renaudin, Yves; and Bordon, Daniel, 4,388,715, Cl. 370-13.000.

Borg-Warner Corporation: *See*—
Dockus, Kostas F.; and Sproul, William D., 4,388,159, Cl. 204-33.000.

Borror, Alan L.; and Ellis, Ernest W., to Polaroid Corporation. Photographic products and processes with silver halide solvent precursors. 4,388,398, Cl. 430-212.000.

Borsanyi, Alexander S., to American Hospital Supply Corporation. Apparatus and method for spontaneous meniscus generation. 4,387,734, Cl. 137-206.000.

Borugian, Dennis A., to Rockwell International Corporation. Electrical brake lining wear indicator. 4,387,789, Cl. 188-1.110.

Boschi, Alide B., to Vitro Tec Fideicomiso. Apparatus and process for the alignment of mechanisms and/or arms for the molds changes in machines for the manufacture of glassware, thermoplastic articles or similars. 4,388,096, Cl. 65-29.000.

Boschung Holding A.G. Freiburg: *See*—
Boschung, Marcel, 4,388,018, Cl. 404-113.000.

Boschung, Marcel, to Boschung Holding A.G. Freiburg. Eccentric-disk tamper. 4,388,018, Cl. 404-113.000.

Botzler, Paul C. Multi-compartment combination package and stirrer device. 4,387,809, Cl. 206-526.000.

Boudreau, Robert A.: *See*—
Rauh, R. David; and Boudreau, Robert A., 4,388,384, Cl. 429-111.000.

Bouge, Gilbert: *See*—
Dupin, Thierry; Bouge, Gilbert; and Poisson, Regis, 4,388,288, Cl. 423-416.000.

Bourgault, Joseph L. Farming implement and elevation control therefor. 4,387,772, Cl. 172-311.000.

Bourgeaux, Pierre: *See*—
Palau, Joseph; and Bourgeaux, Pierre, 4,387,741, Cl. 139-66.00R.

Bourland, Joe D.: *See*—
Geddes, Leslie A.; Bourland, Joe D.; and Pearce, John A., 4,387,714, Cl. 128-303.130.

Bourland, Larry G., to Atlantic Richfield Company. Moldable polyblends. 4,388,443, Cl. 525-67.000.

Bowen Tools, Inc.: *See*—
Bishop, Thomas R.; Chancey, Roger D.; and Kovar, Wayne A., 4,387,885, Cl. 267-125.000.

Bowers, Kerry W.: *See*—
Pratt, Roy E.; Sayles, Scott M.; Bowers, Kerry W.; and Scott, Richard P., deceased, 4,388,176, Cl. 208-80.000.

Bowes, Emmerson; and Pelrine, Bruce P., to Mobil Oil Corporation. Preparation of natural ferrierite hydrocracking catalyst and hydrocarbon conversion with catalyst. 4,388,177, Cl. 208-111.000.

Bowman, John L., Jr.: *See*—
Saar, David A.; Walter, Richard T.; and Bowman, John L., Jr., 4,388,582, Cl. 320-20.000.

Boyer, Lyndon D.: *See*—
Wasson, George E.; Theodore, Frank W.; Boyer, Lyndon D.; and Sooter, Matthew C., 4,388,152, Cl. 201-6.000.

Bradley, Steven A.: *See*—
Shum, Ming S.; Janikowski, Daniel S.; and Bradley, Steven A., 4,388,347, Cl. 427-96.000.

Braginsky, Yakov I.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.

Brandenstein, Manfred; Ernst, Horst M.; and Walter, Lothar, to SKF Kugellagerfabriken GmbH. Rolling bearing incorporating damping means. 4,387,938, Cl. 308-184.00R.

Brandestini, Marco A., to Advanced Technology Laboratories, Inc. Beamforming apparatus and method for ultrasonic imaging systems. 4,387,597, Cl. 73-626.000.

Brandolese, Ernesto, to Snamprogetti S.P.A. Aqueous rust-inhibiting and lubricating compositions. 4,388,199, Cl. 252-33.600.

Branke, Walter; and Winter, Karl, to Karly Mayer Textilmaschinenfabrik GmbH. Brake for a warp knitting machine. 4,387,579, Cl. 66-157.000.

Brastow, Carl H.; Mallett, Joel D.; and Livingston, Douglas J., to Conceptual Engineering Associates, Inc. High voltage welding. 4,388,513, Cl. 219-58.000.

Brasz, Albert J. H.; and Wallink, Hermanus A., to Stamicarbon, B.V. Method for the forming of plastics. 4,388,262, Cl. 264-176.00R.

Braun AG: *See*—
Ullmann, Roland; and Zimmermann, Klaus, 4,388,509, Cl. 200-157.000.

Bredahl, Timothy D.: *See*—
Ethen, John L.; and Bredahl, Timothy D., 4,388,359, Cl. 428-143.000.

Breen, Robert N.; and Goldenberg, Henry R., to Bell Telephone Laboratories, Incorporated. Voiceband data set circuitry with dual bus architecture. 4,388,697, Cl. 364-900.000.

Breisch, Robert C.: *See*—
Graf, Walter A., Jr.; and Breisch, Robert C., 4,388,273, Cl. 422-117.000.

Brennan, Martin J., to Racal Research Limited. Temperature compensation for a liquid crystal display via capacitance compensation of the liquid crystal material. 4,387,963, Cl. 350-331.00T.

Bridges, Robert M.: *See*—
Reed, Chester L.; and Bridges, Robert M., 4,388,709, Cl. 367-131.000.

Bridgestone Tire Company Limited: *See*—
Matsuda, Hideki; Makino, Shigeo; and Sugimura, Noboru, 4,387,758, Cl. 152-353.00R.
Obata, Kazuo; Yamaguchi, Yutaka; Yamaguchi, Kojirou; and Sato, Akio, 4,387,759, Cl. 152-353.00R.
Ogawa, Masaki; and Ikegami, Mikihiko, 4,387,756, Cl. 152-209.00R.
Ogawa, Masaki; and Ikegami, Mikihiko, 4,387,757, Cl. 152-209.00R.

Bridgwater, Jon D.: *See*—
Mansour, Alex E.; and Bridgwater, Jon D., 4,387,882, Cl. 256-17.000.

Briggs, Peter J.; and Carpenter, Steven, to Matburn (Holdings) Limited. Surgical collection bags. 4,387,712, Cl. 604-333.000.

Bringhurst, Edward D.; and Miller, Swend L., to Mannesmann Tally Corporation. Bi-directional, constant velocity, carriage shuttling mechanisms. 4,387,642, Cl. 101-93.040.

Brint, Norman T.; and Williams, Leon J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Firearms with rechargeable magazine. 4,387,524, Cl. 42-18.000.

Broggi, Renato: *See*—
Falciani, Marco; and Broggi, Renato, 4,388,460, Cl. 544-23.000.

Bronchart, Robert: *See*—
Lepain, Andre; Bronchart, Robert; and Remacle, Roger, 4,388,407, Cl. 436-3.000.

Brooks, Grant P., to Bell Telephone Laboratories, Incorporated. Apparatus and method for removing bias distortion from a product demodulator. 4,388,595, Cl. 329-104.000.

Brossi, Arnold; Schmidhammer, Helmut; Jacobson, Arthur E.; and Hsu, Fu-Lian, to United States of America, Health and Human Services. 6-Keto-morphinan analgesics. 4,388,463, Cl. 546-74.000.

Brous, Donald; and Cox, Robert H. Pressure and fluid flow activated, simplified proportioning system. 4,388,184, Cl. 210-96.200.

Brouthers, Paul E.; and MacWilliams, Robert W., to D.W.A. Associates, Inc. Firearm. 4,387,526, Cl. 42-59.000.

Brower, Boyd G.: *See*—
Shaffer, John W.; and Brower, Boyd G., 4,388,606, Cl. 338-15.000.

Brown, Billy G., to Murrell's Welding Works, Inc. Heater. 4,387,669, Cl. 122-235.00A.

Brown, Boveri & Cie AG: *See*—
Mennicke, Stefan; and Weddigen, Gert, 4,388,381, Cl. 429-104.000.

Brown, Charles R.; Kohne, Theodore J.; and Lancto, Donald C., to International Business Machines Corporation. Multi-function financial document processor. 4,387,639, Cl. 101-2.000.

Brown, Ivan R., to Hardine Brothers, Inc. Machine tool chuck. 4,387,905, Cl. 279-1.00C.

Brown, James P.; Gibbins, Graham; and Hampson, Robert S., to Imperial Chemical Industries Limited. Preparing particleboard utilizing a vegetable wax or derivative and polyisocyanate as a release agent on metal press parts. 4,388,138, Cl. 156-289.000.

Brown, Raymond E.: *See*—
Arrazola, Ignacio M.; Brown, Raymond E.; and Dillard, Homer E., 4,387,964, Cl. 350-331.00R.

Brown, Robert J.: *See*—
Hayman, Richard W.; Goldstein, Burton; Lynn, Joe J.; Brown, Robert J.; and Bugash, Robert S., 4,388,689, Cl. 364-401.000.

Brown, Ronald H., to General Electric Company. Apparatus and methods for handling and controlling wire in winding applications. 4,387,745, Cl. 140-92.100.

Brown, Thomas A.: *See*—
Peil, William; Brown, Thomas A.; and Dissoway, Marc A., 4,388,536, Cl. 307-268.000.

Brown, Thomas H., to Smith Kline & French Laboratories Limited. Pyrimidones having histamine H_2-antagonist activity. 4,388,317, Cl. 424-248.510.

Brown, William J., to Bureau of Faculty Research of Wertern Washington University. Apparatus for converting a carburetor for gaseous fuel. 4,387,689, Cl. 123-525.000.

Brown & Williamson Tobacco Corporation: *See*—
Reynolds, Martin L.; and Johnson, Robert R., 4,387,728, Cl. 131-336.000.

Brownawell, Darrell W.; Shaub, Harold; Wisotsky, Max J.; and Gutierrez, Antonio, to Exxon Research & Engineering Co. Co-dispersant stabilized friction modifier lubricating oil composition. 4,388,201, Cl. 252-49.600.

Brownlee, Robert R.; Hughes, Howard C., Jr.; Neff, Paul H.; and Tyers, G. Frank O., to Research Corporation. Pacer internal cardiac electrogram sensing system. 4,387,717, Cl. 128-419.0PG.

Bruck, Robert: *See*—
Bueb, Michael; Bruck, Robert; Muschelknautz, Edgar; Paulini, Dieter; and Feltgen, Karlheinz, 4,387,476, Cl. 8-151.200.

Brueggemann, Harry P., to Xerox Corporation. Projection lens assembly. 4,387,970, Cl. 350-463.000.

Brukovsky, Igor P.: *See*—
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.

Brumbaugh, Eldon M.: *See*—
Falendysz, Eugene L., Sr.; Brumbaugh, Eldon M.; and North, Max R., 4,388,052, Cl. 417-540.000.

Brunner, Karl; Barking, Hans; and Didschies, Gunter, to Siemens Aktiengesellschaft. Method for wrapping three-dimensionally curved conductors. 4,388,127, Cl. 156-53.000.

Buchanan, James F.: *See*—
Arroyo, Nestor A.; Desai, Nitin V.; and Buchanan, James F., 4,388,410, Cl. 436-85.000.

Bucher-Buyer AG: *See*—
Balass, Valentin, 4,387,634, Cl. 100-211.000.

Buchholz, Rainer; Mohn, Hans-Werner; Boms, Hermann; and Zodrow, Rudolf, to Jagenberg-Werke AG. Method and apparatus for affixing strip labels to container closures. 4,388,143, Cl. 156-475.000.

Buchl, Josef: *See*—
Bois, Wilhelm; and Buchl, Josef, 4,388,574, Cl. 318-443.000.

Bud Antle, Inc.: *See*—
Cayton, David W.; Armstrong, Errol C.; and MacKenzie, Angus B., 4,388,035, Cl. 414-417.000.

Budd Company, The: *See*—
Bland, William M., 4,387,931, Cl. 303-1.000.

Bueb, Michael; Bruck, Robert; Muschelknautz, Edgar; Paulini, Dieter; and Feltgen, Karlheinz, to Bayer Aktiengesellschaft. Method and an apparatus for a washing process subsequent to the spinning of synthetic fibers. 4,387,476, Cl. 8-151.200.

Bugash, Robert S.: *See*—
Hayman, Richard W.; Goldstein, Burton; Lynn, Joe J.; Brown, Robert J.; and Bugash, Robert S., 4,388,689, Cl. 364-401.000.

Buhler, Marcel; and Olofsson, Mats, to Societe d'Assistance Technique pour Produits Nestle S.A. Process for the production of a pasteurized cheese in powder form. 4,388,329, Cl. 426-40.000.

Bujadoux, Karel, to Societe Chimique des Charbonnages - CdF CHIMIE. Catalyst for polymerizing ethylene, comprising compounds of several transition metals, and a polymerization process using said catalyst. 4,388,219, Cl. 252-429.00C.

Buljan, Sergej-Tomislav: *See*—
Sarin, Vinod K.; and Buljan, Sergej-Tomislav, 4,388,085, Cl. 51-307.000.

Buncak, Paul. Method and apparatus for performing thin-layer chromatography. 4,388,193, Cl. 210-658.000.

Bureau of Faculty Research of Wertern Washington University: *See*—
Brown, William J., 4,387,689, Cl. 123-525.000.

Buriks, Rudolf S.: *See*—
Naiman, Michael I.; and Buriks, Rudolf S., 4,388,452, Cl. 526-342.000.

Burk, Ronnie F., to Deere & Company. Fluid supply system using one fluid medium to move a second fluid medium. 4,388,049, Cl. 417-396.000.

Burke, Michael G., to International Telephone and Telegraph Corporation. Conference circuit for PCM system. 4,388,717, Cl. 370-62.000.

Burkhart, Russell D.: *See*—
Roach, Maurice P.; Burkhart, Russell D.; and Meehan, James B., 4,387,537, Cl. 51-17.000.

Burkhart, William H., to Smith & Denison. Low resistance electrode system. 4,388,168, Cl. 204-196.000.

Burlington Industries, Inc.: *See*—
Newcomb, Kermit T., 4,387,744, Cl. 139-429.000.

Burns, Lyle D., to Phillips Petroleum Company. Motor fuel. 4,388,081, Cl. 44-78.000.

Burroughs Corporation: *See*—
Hoge, Carl E.; and Lin, Gregory K., 4,388,132, Cl. 156-153.000.
Unger, John C.; Schwartz, Sidney J.; and Chow, Ling G., 4,388,131, Cl. 156-89.000.

Buser, Karl: *See*—
Stettler, Hans; Buser, Karl; and Chavannes, Jean-Pierre, 4,388,205, Cl. 252-135.000.

Bustany, Samir T., to Allied Corporation. Slurry saw blade head assembly. 4,387,698, Cl. 125-18.000.

Butcosk, Richard A., to Mobil Oil Corporation. Anti-rust additives and compositions thereof. 4,388,198, Cl. 252-28.000.

Butler, Clyde R., to General Electric Company. Memory protection arrangement. 4,388,706, Cl. 365-226.000.

Buxton, Robert B.: *See*—
Ishman, Neal H.; Buxton, Robert B.; Durst, Duane A.; McArthur, James F.; and Johnson, Michael E., 4,388,644, Cl. 358-84.000.

BWG Bergwerk- Und Walzwerk- Maschinenbau GmbH: *See*—
Noe, Oskar, 4,387,800, Cl. 198-750.000.

Bykov, Vladimir P.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.

Bykova, Vladimira M.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.

C. E. Conover & Co., Inc.: *See*—
Conover, Charles E., 4,387,902, Cl. 277-203.000.

C. Itoh & Co., Ltd.: *See*—
Uchiyama, Hiroshi, 4,388,119, Cl. 106-316.000.

Cabillic, Jacques: *See*—
Fournier, Jean-Pierre; and Cabillic, Jacques, 4,387,937, Cl. 340-682.000.

Calaani, John R. Disposable discharge collector for a drainable stoma pouch with wiper. 4,387,713, Cl. 604-333.000.

Campbell, John W. E., to Babcock Power Limited. Boilers. 4,387,577, Cl. 60-680.000.

Campbell, Larry K.; and Farrier, William D. Power generating system. 4,388,533, Cl. 290-1.00R.

Campbell Soup Company: *See*—
Egee, Walter W.; and Rickansrud, David A., 4,388,332, Cl. 426-88.000.

Canadian Patents & Development Limited: *See*—
Malatesta, Vincenzo; Willis, Clive; and Hackett, Peter A., 4,388,242, Cl. 260-397.200.
Timbers, Gordon E.; Stark, Robert; Caron, Jacques C.; Cumming, Daniel B.; Cowmeadow, Richard R.; and Gingell, Alexander W., 4,387,630, Cl. 99-348.000.

Canon Kabushiki Kaisha: *See*—
Hosono, Nagao; Kinoshita, Koichi; and Takahashi, Toru, 4,387,664, Cl. 118-658.000.
Masegi, Koichi, 4,387,983, Cl. 355-8.000.
Uchidoi, Masanori; Aizawa, Hiroshi; Urushihara, Kazunobu; Suzuki, Nobuyuki; and Shimizu, Masami, 4,387,977, Cl. 354-60.00R.

Carey, Glen A.: *See*—
Gilford, Saul R.; Emary, Robert J.; and Carey, Glen A., 4,387,991, Cl. 356-246.000.

Carey, Lee F., to Textron Inc. Extendible rocket engine exhaust nozzle assembly. 4,387,564, Cl. 60-242.000.

Carlos, Donald D., to Ashland Oil, Inc. Petrolatum or hydrocarbon wax oxidate composition. 4,388,244, Cl. 260-404.500.

Carman, Vincent E., to Advanced Energy Systems Inc. Fuel-efficient energy storage automotive drive system. 4,387,783, Cl. 180-165.000.

Caron, Jacques C.: *See*—
Timbers, Gordon E.; Stark, Robert; Caron, Jacques C.; Cumming, Daniel B.; Cowmeadow, Richard R.; and Gingell, Alexander W., 4,387,630, Cl. 99-348.000.

Carpenter, David L.: *See*—
Slaughter, Ronald W.; and Carpenter, David L., 4,387,920, Cl. 293-117.000.

Carpenter, Larry L.; and Parham, Thomas G., to Corning Glass Works. Method and apparatus for producing tubular glass article. 4,388,094, Cl. 65-3.120.

Carpenter, Steven: *See*—
Briggs, Peter J.; and Carpenter, Steven, 4,387,712, Cl. 604-333.000.

Carr, Marvin K.; and Smith, Cheryl D., to Diane Kenneth Ltd. Vehicle spare tire carrier. 4,387,837, Cl. 224-42.210.

Carrillo-Cantu, David H.; and Trevino-Alanis, Asdrubal, to Hylsa, S.A. Passivation of sponge iron. 4,388,116, Cl. 106-97.000.

Carter, Charles P. Automatic fence picket pointing machine. 4,387,751, Cl. 144-30.000.

Cartwright, David; and Collins, David J., to Imperial Chemical Industries PLC. Substituted diphenyl ethers. 4,388,472, Cl. 560-21.000.

Casio Computer Co., Ltd.: *See*—
Hagihira, Touru, 4,388,000, Cl. 368-72.000.
Kashio, Toshio, 4,387,619, Cl. 84-1.030.
Shibata, Seiichi, 4,388,629, Cl. 346-81.000.

Casutt, Toni. Method of manufacturing a pack for ovoidal objects. 4,387,549, Cl. 53-456.000.

Caterpillar Tractor Co.: *See*—
Larson, Larry A., 4,387,589, Cl. 73-119.00A.
Stevens, Samuel B.; and Lytle, James R., Sr., 4,387,842, Cl. 226-113.000.

Catotti, Arthur J.: *See—*
West, Jon K.; Catotti, Arthur J.; and Wynn, Michael J., 4,388,120, Cl. 134-15.000.

Cavagnero, Erman V.; and Waligara, Stanley M., to Torin Corporation. Spring coiling machine with improved coil starter means. 4,387,585, Cl. 72-131.000.

Cavallotti, Pietro L.: *See—*
Chen, Tu; and Cavallotti, Pietro L., 4,388,367, Cl. 428-323.000.

Cavanak, Thomas, to Sandoz Ltd. Galenical compositions. 4,388,307, Cl. 424-177.000.

Cawdron, Diane, to General Foods Limited. Dry dessert mix composition. 4,388,337, Cl. 426-573.000.

Cayton, David W.; Armstroag, Errol C.; and MacKenzie, Angus B., to Bud Antle, Inc. Dibble tube soil plug planter. 4,388,035, Cl. 414-417.000.

Celanese Corporation: *See—*
Kalnin, Ilmar L., 4,388,227, Cl. 252-510.000.
Shimp, David A., 4,388,374, Cl. 428-414.000.

Cenci, Harry J.: *See—*
Swift, Graham; Cenci, Harry J.; and Jenkins, Raymond F., 4,388,434, Cl. 524-476.000.

Centre National d'Etudes Spatiale: *See—*
Regipa, Robert, 4,387,868, Cl. 244-31.000.

Centro Ricerche Fiat S.p.A.: *See—*
Ferrero, Mario; and Balestrino, Giovanni, 4,388,516, Cl. 219-119.000.

Chaiken, Robert F., to United States of America, Interior. Method for controlled burnout of abandoned coal mines and waste banks. 4,387,655, Cl. 110-347.000.

Chamberland, Andre M.; and Gauthier, Michel, to Hydro-Quebec. Solid sensor for anhydrides. 4,388,155, Cl. 204-1.00T.

Champaneria, Nitin J.; Harper, Lee R.; and Hosegood, Edward A., to Du Pont de Nemours, E. I., and Company. Durable antisoiling coatings for textile filaments. 4,388,372, Cl. 428-395.000.

Champion International Corporation: *See—*
Austin, John J., 4,387,804, Cl. 206-218.000.
Donisi, Frederick A., 4,387,749, Cl. 141-68.000.
Sullivan, John; and Lillibridge, Harold R., 4,388,071, Cl. 493-333.000.

Champion Spark Plug Company: *See—*
Bensman, Richard W., 4,388,549, Cl. 313-138.000.

Chan, Paul C. F.: *See—*
United States of America, National Aeronautics and Space Administration; Corcoran, William H.; Fong, William S.; Pichaichanarong, Puvin; Chan, Paul C. F.; and Lawson, Daniel D., 4,388,171, Cl. 208-8.0LE.

Chancey, Roger D.: *See—*
Bishop, Thomas R.; Chancey, Roger D.; and Kovar, Wayne A., 4,387,885, Cl. 267-125.000.

Chandler, Earl E. Apparatus for supportingly organizing and displaying miscellaneous articles. 4,387,940, Cl. 312-184.000.

Chang, Clarence D.; and Perkins, Patrick D., to Mobil Oil Corporation. Process for producing alpha-picoline. 4,388,461, Cl. 546-251.000.

Chapman, Hugh N.: *See—*
Aswell, Cecil J.; and Chapman, Hugh N., 4,387,503, Cl. 29-575.000.

Chatterjea, Probir K., to Dresser Industries, Inc. Modulated transmission with modulator-load-piston loading at linear rate after full reset. 4,387,731, Cl. 137-115.000.

Chavannes, Jean-Pierre: *See—*
Stettler, Hans; Buser, Karl; and Chavannes, Jean-Pierre, 4,388,205, Cl. 252-135.000.

Chen, De-Yu: *See—*
Bedard, James F.; Eichelberger, Charles W.; and Chen, De-Yu, 4,388,566, Cl. 315-291.000.

Chen, Hsing-Yao, to RCA Corporation. Color picture tube having an expanded focus lens type inline electron gun with an improved stigmator. 4,388,553, Cl. 313-414.000.

Chen, Richard, to National Patent Development Co. Permeable contact lens. 4,388,436, Cl. 524-553.000.

Chen, Tu; and Cavallotti, Pietro L., to Xerox Corporation. Perpendicular magnetic recording medium and fabrication. 4,388,367, Cl. 428-323.000.

Chessell Limited: *See—*
Houldsworth, John, 4,388,631, Cl. 346-141.000.

Chevron Research Company: *See—*
Lewis, Robert T., 4,388,179, Cl. 208-177.000.
Rainis, Andrew, 4,388,180, Cl. 209-5.000.
Rainis, Andrew; and Detz, Clifford M., 4,388,181, Cl. 209-12.000.
Wollenberg, Robert H., 4,388,471, Cl. 549-255.000.

Chiavaroli, Donald J., to Texas Instruments Incorporated. Fuel evaporation device. 4,387,690, Cl. 123-549.000.

Chinn, Leland J., to G. D. Searle & Co. Method for the induction of menses. 4,388,311, Cl. 424-238.000.

Chiyoda Chemical Engineering & Construction: *See—*
Matsumoto, Osamu; and Aoki, Ichizo, 4,388,092, Cl. 62-24.000.

Choby, David; Crawford, James; and Mariel, James, to Excel Industries, Inc. Vehicle window assembly. 4,387,923, Cl. 296-201.000.

Chou, Eng J.; and Weinstein, Bruce, to Research-Cottrell, Inc. Method for regeneration of sodium sulfite from spent flue gas desulfurization processes. 4,388,282, Cl. 423-242.000.

Choudary, Uppala V.: *See—*
Kapur, Vijay K.; and Choudary, Uppala V., 4,388,286, Cl. 423-348.000.

Chow, Ling G.: *See—*
Unger, John C.; Schwartz, Sidney J.; and Chow, Ling G., 4,388,131, Cl. 156-89.000.

Christ, Richard: *See—*
Knackstedt, Hans-Gunther; Muller, Erhard; Christ, Richard; and Kroll, Hartmut, 4,388,268, Cl. 376-272.000.

Christensen, Burton G.; DiNinno, Frank P.; Mathard, David A.; and Ratcliffe, Ronald W., to Merck & Co., Inc. 6-Amido-2-S-oxides of substituted 2-organothio-pen-2-em-3-carboxylic acids. 4,388,310, Cl. 424-200.000.

Christian, Pfeiffer: *See—*
Thomas, Franz, 4,388,183, Cl. 209-139.00A.

Christiansen, Soren B., to F. L. Smidth & Co. Method and apparatus for operating a kiln plant with solid fuel firing in the precalcining zone. 4,388,067, Cl. 432-14.000.

Chu, Mike S., to Erie Technological Products, Inc. High voltage dielectric (SRT 103). 4,388,415, Cl. 501-136.000.

Ciba-Geigy Corporation: *See—*
Fory, Werner; Martin, Henry; and Pisiotas, Georg, 4,388,106, Cl. 71-105.000.
Kristinsson, Haukur; Muller, Best; and Pachlatko, Johannes P., 4,388,464, Cl. 548-136.000.

Cichanowski, Stanley W., to General Electric Company. Polyglycol dielectric capacitor fluid. 4,388,669, Cl. 361-319.000.

Cinderella AB: *See—*
Hellqvist, Ake O. V., 4,388,192, Cl. 210-615.000.

Citizen Watch Co., Ltd.: *See—*
Nishikubo, Yasuhiko, 4,388,001, Cl. 368-87.000.

Clark Reliance Corp., The: *See—*
Balazs, Les; and Winiasz, Michael E., 4,387,733, Cl. 137-185.000.

Clesid S.A.: *See—*
Leveques, Marc, 4,387,883, Cl. 266-158.000.

Cleveland, Dixon: *See—*
Jamieson, John M.; and Cleveland, Dixon, 4,387,598, Cl. 73-637.000.

Clifford, Alfred: *See—*
Otting, Billy J.; and Clifford, Alfred, 4,387,475, Cl. 8-151.000.

Clifford, David P., to Dow Chemical Company Limited, The. Method for preparing 2-chlorobenzoyl chloride. 4,388,251, Cl. 260-544.00D.

Cline, Charles D., to Rockwell International Corporation. Fiber optic interlock. 4,387,956, Cl. 350-96.200.

Clinton, Henry H. Electronic band marking controller. 4,387,665, Cl. 118-674.000.

Cobianco, Roger. Adjustable brush. 4,387,480, Cl. 15-169.000.

Cochrane, Peter R., to Hazeltine Corporation. Truss array for supporting devices within a fluid medium. 4,388,023, Cl. 405-195.000.

Cocker, Michael J., to Legg, Peter George; and Tindall, Melvyn Alan. Panic bolt units. 4,387,917, Cl. 292-40.000.

Cocola, Francesco; Tarli, Paolo; and Neri, Paolo, to Istituto Sieroterapico e Vaccinogeno Toscano "Sclavo" S.p.A. Method and composition for determining human chrionic somatropin. 4,388,295, Cl. 424-1.000.

Codispoti, Thomas E.; Giustino, James M.; Griffith, Richard M.; and Tsai, James T., to General Tire & Rubber Company, The. Method for forming a compartmented puncture sealant package by co-extrusion. 4,388,261, Cl. 264-171.000.

Coen Company, Inc.: *See—*
Binasik, Chester S.; and Siegert, Louis D., 4,387,654, Cl. 110-347.000.

Coghill, Ian: *See—*
Crook, Richard W.; and Coghill, Ian, 4,388,623, Cl. 343-709.000.

Cohn, Robert B., to United States of America, National Aeronautics and Space Administration. Adapter for mounting a microphone flush with the external surface of the skin of a pressurized aircraft. 4,388,502, Cl. 179-179.000.

Collins, David J.: *See—*
Cartwright, David; and Collins, David J., 4,388,472, Cl. 560-21.000.

Combustion Engineering, Inc.: *See—*
Goodstine, Stephen L.; and Jukkola, Glen D., 4,387,667, Cl. 122-4.00D.
Kochey, Edward L., Jr., 4,387,668, Cl. 122-6.00A.
Moore, Richard F., 4,387,651, Cl. 110-171.000.

Commercial Resins Company: *See—*
Hughes, William L., 4,388,510, Cl. 219-8.500.

Commodore Electronics, Ltd.: *See—*
Hyltin, Tom M., 4,388,563, Cl. 315-205.000.

Compagnie industrielle Des Telecommunications Cit-Alcatel: *See—*
Renaudin, Yves; and Bordon, Daniel, 4,388,715, Cl. 370-13.000.

Computer Power, Inc.: *See—*
Love, Roger R.; and Metroke, John, 4,388,534, Cl. 307-66.000.

Conceptual Engineering Associates, Inc.: *See—*
Brastow, Carl H.; Mallett, Joel D.; and Livingston, Douglas J., 4,388,513, Cl. 219-58.000.

Confalonieri, Carlo: *See—*
Nannini, Giuliano; Perrone, Ettore; Severino, Dino; Meinardi, Giuseppe; Monti, Gisella; Bianchi, Alberta; Forgione, Angelo; and Confalonieri, Carlo, 4,388,314, Cl. 424-246.000.

Connell, Calvin C. Valve train. 4,387,674, Cl. 123-90.160.

Conoco Inc.: *See—*
Wasson, George E.; Theodore, Frank W.; Boyer, Lyndon D.; and Sooter, Matthew C., 4,388,152, Cl. 201-6.000.

Conover, Charles E., to C. E. Conover & Co., Inc. Elastomeric seal ring with self-lubricating wear-reducing feature. 4,387,902, Cl. 277-203.000.

Conroy, Walter J.: *See—*
Hall, Roger L.; and Conroy, Walter J., 4,387,951, Cl. 339-193.00R.

Consan Pacific Incorporated: *See—*
Saurenman, Donald G., 4,388,667, Cl. 361-231.000.

Consolidation Coal Company: *See*—
Jamison, Will B.; and Hazen, David R., 4,387,798, Cl. 198-587.000.

Consortium fur Elektrochemische: *See*—
Finkelmann, Heino; Rehage, Gunther; and Kreuzer, Franz-Heinrich, 4,388,453, Cl. 528-15.000.

Construction Materials, Inc.: *See*—
Levey, Bertram J., 4,388,016, Cl. 404-48.000.

Container Industries, Inc.: *See*—
Venus, Frank, Jr., 4,387,833, Cl. 222-95.000.

Conti, Vincent N., to Itnoc Dairy Cap Co. Inc. Snap-on tamper-proof closure. 4,387,818, Cl. 215-256.000.

Cook, Steven L.: *See*—
Hembre, Robert T.; and Cook, Steven L., 4,388,217, Cl. 252-413.000.

Cooke, Claude E., Jr.: *See*—
Erbstoesser, Steven R.; Cooke, Claude E., Jr.; Sinclair, Richard G.; and Epstein, Michael M., 4,387,769, Cl. 166-295.000.

Cooke, Jeremy C. R.; and Tilley, Frederick H., to Foster Wheeler Power Products Limited. Furnace. 4,387,652, Cl. 110-224.000.

Cooper Industries, Inc.: *See*—
Berry, Richard C., 4,387,829, Cl. 220-374.000.

Cooper, James L., to Eastman Kodak Company. Hydroformylation process with rhodium catalyst and oxygen stabilization thereof. 4,388,476, Cl. 568-451.000.

Cooper, James L., to Eastman Kodak Company. Hydroformylation process employing unmodified rhodium-cobalt catalyst. 4,388,477, Cl. 568-451.000.

Copeland, Claude T.: *See*—
Nimerick, Kenneth H.; and Copeland, Claude T., 4,388,203, Cl. 252-70.000.

Coquillart, Michel, to Mavilor Systemes. Machine for flats or conical windings in the form of a disc for electric motors. 4,387,504, Cl. 29-598.000.

Corbo, Thomas A., to Manco Tape, Inc. Adjustable threshold assembly. 4,387,535, Cl. 49-468.000.

Corcoran, William H.: *See*—
United States of America, National Aeronautics and Space Administration; Corcoran, William H.; Fong, William S.; Pichaichanarong, Puvin; Chan, Paul C. F.; and Lawson, Daniel D., 4,388,171, Cl. 208-8.0LE.

Cordis Corporation: *See*—
De Haan, Abel; and Tataria, Harshad, 4,388,380, Cl. 429-91.000.

Cormier, Raymond G., to Nashua Corporation. Sheet stripping apparatus and method. 4,387,981, Cl. 355-3.0SH.

Corning Glass Works: *See*—
Carpenter, Larry L.; and Parham, Thomas G., 4,388,094, Cl. 65-3.120.
Shay, George C., 4,387,505, Cl. 29-623.100.

Corsette, Douglas F. Sealing means for a snap-on fitment. 4,387,819, Cl. 215-273.000.

Corzine, Gerald G.; and Hagar, Charles E., to United States of America, Navy. Method for testing fluid control valves. 4,387,591, Cl. 73-168.000.

Cosden Technology, Inc.: *See*—
Schwarz, Richard A., 4,388,418, Cl. 521-56.000.

Couceiro, Nuno P., to General Motors Corporation. Cold starting system for alcohol fueled engine. 4,387,676, Cl. 123-179.00H.

Coughlin, William J.; Hoffman, Stephen A.; and Rieppel, Perry J., to Arcair Company. Method for collecting process generated fume and/or slag. 4,388,514, Cl. 219-69.00R.

Cowan, David A., to Maryland Cup Corporation. Heat-sealable, ovenable containers and method of manufacture. 4,387,551, Cl. 53-478.000.

Cowdin, Kenneth T., to United States of America, National Aeronautics and Space Administration. Aircraft body-axis rotation measurement system. 4,387,513, Cl. 33-322.000.

Cowher, Melvyn E.: *See*—
Shuskus, Alexander J.; and Cowher, Melvyn E., 4,388,344, Cl. 427-38.000.

Cowmeadow, Richard R.: *See*—
Timbers, Gordon E.; Stark, Robert; Caron, Jacques C.; Cumming, Daniel B.; Cowmeadow, Richard R.; and Gingell, Alexander W., 4,387,630, Cl. 99-348.000.

Cowsar, Donald R.: *See*—
Davis, Thomas A.; and Cowsar, Donald R., 4,388,358, Cl. 428-71.000.

Cox, Charles M.; and Turner, Rudolf, to Zenith Radio Corporation. Color control circuit for teletext-type decoder. 4,388,639, Cl. 358-27.000.

Cox, Charles M.; and Thomas, William L., to Zenith Radio Corporation. Teletext communication system with timed multipage local memory. 4,388,645, Cl. 358-147.000.

Cox, Robert H.: *See*—
Brous, Donald; and Cox, Robert H., 4,388,184, Cl. 210-96.200.

Craig, Laurence B.; and Farina, Alfred J. Combustion heating system. 4,388,063, Cl. 431-19.000.

Craven, Ian: *See*—
Richards, John W.; and Craven, Ian, 4,388,590, Cl. 324-103.00P.

Crawford, James: *See*—
Choby, David; Crawford, James; and Mariel, James, 4,387,923, Cl. 296-201.000.

Cremer, Peter: *See*—
Wefers, Werner, 4,387,824, Cl. 220-23.400.

Crickmer, Charles C.: *See*—
Pezzillo, William A.; and Crickmer, Charles C., 4,388,614, Cl. 340-384.00E.

Cripe, Christopher A., to Bi-Modal Corporation, The. Relay-load/ratio valve for use in brake applications on air-spring equipped vehicles. 4,387,933, Cl. 303-22.00A.

Crivello, James V., to General Electric Company. Aromatic polyvinyl ethers and heat curable molding compositions obtained therefrom. 4,388,450, Cl. 525-502.000.

Crocker, Alfred J. Energy transfer apparatus. 4,387,672, Cl. 123-55.0AA.

Crook, Richard W.; and Coghill, Ian, to Marconi Company Limited, The. Antennas. 4,388,623, Cl. 343-709.000.

Crosslen, Louis J., to Frank Mayer & Associates, Inc. Shingled rack display device. 4,387,810, Cl. 211-49.00D.

Crown Cork & Seal Company, Incorporated: *See*—
Ruemer, John, Jr., 4,387,827, Cl. 220-269.000.

Csanak, George: *See*—
Doremus, Robert H.; Csanak, George; Kale, B. Michael; and Moore, James E., 4,388,413, Cl. 501-40.000.

Culbertson, Billy M.; Post, Larry K.; and Aulabaugh, Ann E., to Ashland Oil, Inc. Polymers derived from allylphenol or substituted allylphenol and maleic anhydride. 4,388,451, Cl. 526-271.000.

Cumming, Daniel B.: *See*—
Timbers, Gordon E.; Stark, Robert; Caron, Jacques C.; Cumming, Daniel B.; Cowmeadow, Richard R.; and Gingell, Alexander W., 4,387,630, Cl. 99-348.000.

Cummins, Earl W., to Du Pont de Nemours, E. I., and Company. Method of increasing milk production of dairy cattle. 4,388,327, Cl. 426-2.000.

Curlee, Thomas O., III; and Richardson, Ethel L., to International Business Machines Corp. Shared TOD clock modification bit. 4,388,688, Cl. 364-200.000.

Curtis Instruments, Inc.: *See*—
Finger, Eugene P., 4,388,618, Cl. 340-636.000.

Curtiss-Wright Corporation: *See*—
Leto, Anthony, 4,387,559, Cl. 60-39.320.

Cusimano, John L.: *See*—
Hruda, Robert M.; and Cusimano, John L., 4,388,504, Cl. 200-76.000.

Cyclops Corporation: *See*—
Wehr, David M., 4,387,542, Cl. 52-209.000.

Cynex Manufacturing Corporation: *See*—
Green, Dan; and Goldner, Sandor, 4,388,578, Cl. 318-729.000.

D.W.A. Associates, Inc.: *See*—
Brouthers, Paul E.; and MacWilliams, Robert W., 4,387,526, Cl. 42-59.000.

Dagani, Michael J., to Ethyl Corporation. Process for producing substituted pyrroles. 4,388,468, Cl. 548-531.000.

Dahl, Ernest A.; and Barry, George H. Battery monitoring and charger control system. 4,388,584, Cl. 320-48.000.

Dahlberg, Anders I. Dual chamber sealing element with hardening filler. 4,387,899, Cl. 277-34.300.

Daimler-Benz Aktiengesellschaft: *See*—
Bartel, Gunter; Patz, Eckhard; Koch, Karl; Stern, Georg; Stotz, Manfred; and Triffterer, Adolf, 4,388,053, Cl. 417-542.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Yamada, Mitsuhiko, 4,388,653, Cl. 358-302.000.

Danly Machine Corporation: *See*—
Heiberger, Francis E., 4,387,632, Cl. 100-45.000.

Dart Industries Inc.: *See*—
Gerteisen, Steven R.; and Wetzel, David R., 4,388,422, Cl. 523-137.000.

Dasting, Klaus: *See*—
Holland-Letz, Gunter; and Dasting, Klaus, 4,387,645, Cl. 101-327.000.

Davis, James E. P. Pneumatic percussor. 4,387,708, Cl. 128-55.000.

Davis, Thomas A.; and Cowsar, Donald R., to University of Alabama; and Southern Research Institute. Adaptive support system. 4,388,358, Cl. 428-71.000.

Dayton Rogers Manufacturing Co.: *See*—
Ireland, Ralph, 4,387,616, Cl. 83-608.000.

De Forenede Bryggerier A/S: *See*—
Johansen, Jack T., 4,388,406, Cl. 435-189.000.

de la Rosa, Jorge. Ring cover protector for records. 4,387,807, Cl. 206-312.000.

Deason, Max W. Apparatus for forming pool deck and coping. 4,387,877, Cl. 249-9.000.

Dechelette, Helen, to AMP Incorporated. Method of manufacturing an electrical interconnection assembly. 4,387,509, Cl. 29-850.000.

de Cointet de Fillain, Paul; and Pigerol, Charles, to Sanofi. Associations for stabilizing vinyl resins. 4,388,430, Cl. 524-99.000.

Deepsea Ventures, Inc.: *See*—
Latimer, John P., 4,387,518, Cl. 37-57.000.

Deere & Company: *See*—
Adickes, Henning, 4,387,915, Cl. 285-330.000.
Burk, Ronnie F., 4,388,049, Cl. 417-396.000.

de Figueiredo, Mario P.; Guevara, Balagtas F.; Long, James L.; Morgan, Ronnie G.; and York, Lawrence R., to Ralston Purina Company. Process for the production of a frozen chopped egg product. 4,388,340, Cl. 426-614.000.

Degussa Aktiengesellschaft: *See*—
Fratzer, Gerhard; Beck, Bernhard; Dold, Erwin; and Klebe, Hans, 4,388,275, Cl. 422-180.000.

De Haan, Abel; and Tataria, Harshad, to Cordis Corporation. Lithium cell having depletion gauge. 4,388,380, Cl. 429-91.000.

Dehaene, Jean P., to Thomson-CSF. System for the ultra-high frequency transmission of numerical data. 4,388,726, Cl. 375-44.000.

Dekker, Lambert: *See*—
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,388,228, Cl. 252-522.00R.

Delta Promotions, Inc.: *See*—
Hedstrom, Mark D., 4,387,529, Cl. 43-112.000.

Denard, Ruthie. Disposable urine collection device for human males. 4,387,726, Cl. 128-760.000.

Dendor, Paul: *See*—
Johnson, Craig; Dendor, Paul; and Hodgkins, Harry L., 4,388,126, Cl. 149-14.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Taniguchi, Yasuo; Asano, Toshio; Funami, Haruo; and Itou, Kouichi, 4,388,442, Cl. 525-60.000.

Depew, Dean A.; and Murphy, Harold K., to Murphy, Harold K. Apparatus for crushing and removing rims from wheels. 4,387,636, Cl. 100-232.000.

Derrien, Jean-Yves; and Belon, Paul, to Rhone-Poulenc Industries. Preparation of mixed oxide catalysts comprising the oxides of molybdenum and/or tungsten. 4,388,226, Cl. 252-470.000.

Desai, Nitin V.: *See*—
Arroyo, Nestor A.; Desai, Nitin V.; and Buchanan, James F., 4,388,410, Cl. 436-85.000.

Deskins, Robert L.; Matlack, Gary L.; and Ashbaugh, Robert D., to Harco Corporation. Semi-permeable electrolytic cell and method for surveying buried structures. 4,388,594, Cl. 324-348.000.

De Swarte, Thomas W.: *See*—
Howard, Peter B.; Boelitz, Martin V.; and De Swarte, Thomas W., 4,387,865, Cl. 244-3.100.

Detz, Clifford M.: *See*—
Rainis, Andrew; and Detz, Clifford M., 4,388,181, Cl. 209-12.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Musical tone generator with independent time varying harmonics. 4,387,622, Cl. 84-1.220.

Deveaux, Rene, to Societe d'Assistance Technique pour Produits Nestle S.A. Mould for packaging desserts. 4,388,334, Cl. 426-112.000.

de Vries, Gerhard H. F., to U.S. Philips Corporation. Gas discharge display panel having hollow cathodes. 4,388,550, Cl. 313-585.000.

Devro, Inc.: *See*—
Miller, Albert T., 4,388,331, Cl. 426-63.000.

Dewert, Heribert: *See*—
Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; and Dewert, Heribert, 4,388,281, Cl. 423-210.000.

Dewey, Richard H.; Hwang, Bruce Y.; and Kuo, George Y., to Smith-Kline Beckman Corporation. 6-Chloro-7,8-dihydroxy-1-(p-hydroxyphenyl)-2,3,4,5-tetrahydro-1H-3-benzazepine sulfate esters. 4,388,240, Cl. 260-239.0BB.

Diane Kenneth Ltd.: *See*—
Carr, Marvin K.; and Smith, Cheryl D., 4,387,837, Cl. 224-42.210.

Diaz, Zaida, to Shell Oil Company. H_2S Removal. 4,388,293, Cl. 423-573.00R.

Dick, Edward R. Apparatus for heating and spraying viscous coating material. 4,387,851, Cl. 239-135.000.

Dickson, Dale A.: *See*—
Bilitz, Mark R.; and Dickson, Dale A., 4,387,718, Cl. 128-419.00R.

Didschies, Gunter: *See*—
Brunner, Karl; Barking, Hans; and Didschies, Gunter, 4,388,127, Cl. 156-53.000.

Diehl GmbH & Co.: *See*—
Weidner, Peter; and Wich, Harald, 4,387,649, Cl. 102-215.000.

Diesel Kiki Kabushiki Kaisha: *See*—
Tada, Yoshiharu; and Kitano, Yuichi, 4,388,571, Cl. 318-293.000.

Digital Equipment Corporation: *See*—
Kotok, Alan; Murphy, Daniel L.; and Stewart, Robert E., 4,388,685, Cl. 364-200.000.

Dillard, Homer E.: *See*—
Arrazola, Ignacio M.; Brown, Raymond E.; and Dillard, Homer E., 4,387,964, Cl. 350-331.00R.

Dimond, Harold L.; and Murphy, Thomas J., to Drackett Company, The. Thickened alkali metal hypochlorite compositions. 4,388,204, Cl. 252-98.000.

Dineen, John J., to Mechanical Technology Incorporated. Stirling engine displacer gas bearing. 4,387,568, Cl. 60-520.000.

DiNinno, Frank P.: *See*—
Christensen, Burton G.; DiNinno, Frank P.; Muthard, David A.; and Ratcliffe, Ronald W., 4,388,310, Cl. 424-200.000.

Director-General of the Agency of Industrial Science and Technology: *See*—
Tanihara, Koichi, 4,388,474, Cl. 564-241.000.

Dischert, Robert A.; and Reitmeier, Glenn A., to RCA Corporation. De-emphasis for digitized composite color television signals. 4,388,638, Cl. 358-27.000.

Dissosway, Marc A.: *See*—
Peil, William; Brown, Thomas A.; and Dissosway, Marc A., 4,388,536, Cl. 307-268.000.

Ditcher, Jack; and Westhoff, James A., to A-Lok Products, Inc. Method and apparatus for providing watertight seal for manhole pipe connection. 4,387,900, Cl. 277-101.000.

Diving Unlimited International, Inc.: *See*—
Long, Richard W.; and Stinton, Robert T., 4,388,134, Cl. 156-248.000.

Dobfar S.p.A.: *See*—
Falciani, Marco; and Broggi, Renato, 4,388,460, Cl. 544-23.000.

Dockus, Kostas F.; and Sproul, William D., to Borg-Warner Corporation. Surface preparation of aluminum articles. 4,388,159, Cl. 204-33.000.

Dodds, Dennis L., to RCA Corporation. Electron beam influencing apparatus incorporating vertical beam movement function. 4,388,602, Cl. 335-212.000.

Dolby Laboratories, Inc.: *See*—
Spencer, Paul A.; and Dolby, Ray M., 4,388,729, Cl. 455-72.000.

Dolby, Ray M.: *See*—
Spencer, Paul A.; and Dolby, Ray M., 4,388,729, Cl. 455-72.000.

Dold, Erwin: *See*—
Fratzer, Gerhard; Beck, Bernhard; Dold, Erwin; and Klebe, Hans, 4,388,275, Cl. 422-180.000.

Dolomite S.p.A.: *See*—
Annovi, Giuseppe, 4,387,517, Cl. 36-117.000.

Dom, Harry A., to National Machinery Company, The. Semi-automatic tool changer. 4,387,502, Cl. 29-568.000.

Domagalski, Anthony: *See*—
Mattson, Charles A.; Michel, James; and Domagalski, Anthony, 4,387,852, Cl. 239-143.000.

Donini, Frederick A., to Champion International Corporation. Filler sleeve for use in conjunction with a bag adapted to contain a granular product. 4,387,749, Cl. 141-68.000.

Dooley, James A., to General Electric Company. Noise isolation means for convoluted sheathed electric heater. 4,388,519, Cl. 219-463.000.

Doremus, Robert H.; Csanak, George; Kale, B. Michael; and Moore, James E. Silver halide glasses. 4,388,413, Cl. 501-40.000.

Dornbusch, Arthur H., to Procter & Gamble Company, The. Shipping device. 4,387,808, Cl. 206-432.000.

Dorr, Ralph. Rotating sail fluid current motor. 4,388,041, Cl. 416-119.000.

Dow Chemical Company, The: *See*—
Bales, Stephen E., 4,388,455, Cl. 528-176.000.
Naffziger, David H., 4,388,297, Cl. 424-78.000.
Nimerick, Kenneth H.; and Copeland, Claude T., 4,388,203, Cl. 252-70.000.

Dow Chemical Company Limited, The: *See*—
Clifford, David P., 4,388,251, Cl. 260-544.00D.

Down, Peter E.; and Salem, Eli, to Ecodyne Corporation. Regeneration of deep bed condensate polishers. 4,388,417, Cl. 521-26.000.

Downey, Donald O. Container for storing particulate materials. 4,387,847, Cl. 232-43.100.

Drackett Company, The: *See*—
Dimond, Harold L.; and Murphy, Thomas J., 4,388,204, Cl. 252-98.000.

Dranchak, John S. Drum supporting harness. 4,387,839, Cl. 224-265.000.

Dravo Corporation: *See*—
Blair, Gilbert; and Dusel, Martin C., 4,388,153, Cl. 202-248.000.

Dresler, Helmut; and Turnwald, Ernst, to Linde Aktiengesellschaft. Piston pump with intake valve. 4,388,051, Cl. 417-505.000.

Dresser Industries, Inc.: *See*—
Chatterjea, Probir K., 4,387,731, Cl. 137-115.000.
McCaskill, James N., Jr., 4,387,514, Cl. 34-31.000.
McPhee, William A., 4,387,773, Cl. 175-4.600.
Pisani, Marino J., 4,387,779, Cl. 180-9.500.
Read, Norman W., 4,387,767, Cl. 166-72.000.

Druffel, James B., to Prescolite, A Div. of U.S. Industries. Recessed lighting unit. 4,388,677, Cl. 362-276.000.

Drury, Michael J.: *See*—
Test, Howard R., II; and Drury, Michael J., 4,388,696, Cl. 364-900.000.

DuCorday, Gerard M. Bag handle. 4,387,846, Cl. 229-54.00R.

Dudek, Gunter, to Prameta Prazisionsmetaal-und Kunststofferzeugnisse G. Baumann & Co. Clasp for locking a ligature loop. 4,387,489, Cl. 24-133.000.

Duff, Kenneth R. Amphibious motor-driven cycle. 4,387,661, Cl. 114-270.000.

Duke, J. Douglas. Arrow point puller and bow stabilizer. 4,387,697, Cl. 124-89.000.

Dukes, Allen E.; and Bailey, David C., to Harris Corporation. Synchronized, variable speed capstan motor drive system for facsimile recorder. 4,388,652, Cl. 358-285.000.

Dummer, Gerhard: *See*—
Schmidhammer, Ludwig; Dummer, Gerhard; and Straszer, Rudolf, 4,388,278, Cl. 423-488.000.

Dunham Bush, Inc.: *See*—
Shaw, David N.; and Gagnon, Joseph A. L. N., 4,388,048, Cl. 417-310.000.

Dunphy, Gerald F.; and Esser, Hans J., to Ogden Industries Pty. Ltd. Deadlock mechanism. 4,387,918, Cl. 292-224.000.

Dupin, Thierry; Bouge, Gilbert; and Poisson, Regis, to Rhone-Poulenc Industries. Preparation of shaped titanium dioxide catalyst/carrier and catalysis of gaseous sulfur compounds therewith. 4,388,288, Cl. 423-416.000.

Du Pont de Nemours, E. I., and Company: *See*—
Champaneria, Nitin J.; Harper, Lee R.; and Hosegood, Edward A., 4,388,372, Cl. 428-395.000.
Cummins, Earl W., 4,388,327, Cl. 426-2.000.
Hawkins, William E., 4,387,841, Cl. 226-97.000.
Melby, Lester R., 4,388,448, Cl. 525-327.300.
Richter, John W., 4,388,212, Cl. 252-356.000.

Dupont, Robert. Non-return valve with a directional injector. 4,387,854, Cl. 239-570.000.

Dupressoir, Albert, to "Thomson-CSF". Radar antenna incorporating elements radiating a pseudo-omnidirectional pattern. 4,388,624, Cl. 343-727.000.

Durango Systems, Inc.: *See*—
Waibel, Helmut K., 4,388,006, Cl. 400-195.000.

Durant, Graham J.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. N-Heterocyclic alkyl-N'-thiadiazolyl, thiazolyl and isothiazolyl alkylthioureas, ureas and guanidines. 4,388,319, Cl. 424-270.000.

Durkin, Joseph A.: *See*—
Lewis, Paul H.; Durkin, Joseph A.; and Froelich, Joseph A., 4,388,178, Cl. 208-115.000.

Durr, Helmut E.; and Mock, George E., to Western Electric Company, Inc. Conditioning apparatus for case metal bars. 4,388,029, Cl. 409-295.000.

Dursch, Walter; and Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Process for the manufacture of vinyl phosphonic acid derivatives. 4,388,252, Cl. 260-968.000.

Durst, Duane A.: *See*—
Ishman, Neal H.; Buxton, Robert B.; Durst, Duane A.; McArthur, James F.; and Johnson, Michael E., 4,388,644, Cl. 358-84.000.

Dusel, Martin C.: *See*—
Blair, Gilbert; and Dusel, Martin C., 4,388,153, Cl. 202-248.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Wlodkowski, Johann; and Jungwirth, Dieter, 4,388,014, Cl. 403-369.000.

Dysarz, Edward D., to James G. Brown & Associates, Inc. Support structure for offshore platforms. 4,388,024, Cl. 405-198.000.

E. C. Chemical Ind. Co., Ltd.: *See*—
Uchiyama, Hiroshi, 4,388,119, Cl. 106-316.000.

E.C.H. Will (GmbH & Co.): *See*—
Lampe, Seigfried, 4,387,890, Cl. 271-225.000.

E. R. Squibb & Sons, Inc.: *See*—
Jensen, Ole R., 4,388,135, Cl. 156-250.000.

E-Systems, Inc.: *See*—
Ishman, Neal H.; Buxton, Robert B.; Durst, Duane A.; McArthur, James F.; and Johnson, Michael E., 4,388,644, Cl. 358-84.000.

Eaglestone, Dustin D. Fuel filter. 4,388,187, Cl. 210-232.000.

Eastman Kodak Company: *See*—
Barbee, Robert B.; and Minnick, Larry A., 4,388,456, Cl. 528-289.000.
Cooper, James L., 4,388,476, Cl. 568-451.000.
Cooper, James L., 4,388,477, Cl. 568-451.000.
Garcia, Enrique, 4,388,532, Cl. 250-578.000.
Hembre, Robert T.; and Cook, Steven L., 4,388,217, Cl. 252-413.000.
Jeffers, Frederick; and McClure, Richard J., 4,388,662, Cl. 360-113.000.
Lemke, James U., 4,388,656, Cl. 360-33.100.
Lemke, James U., 4,388,659, Cl. 360-90.000.

Eaton Corporation: *See*—
Pipes, George R., 4,388,033, Cl. 414-282.000.
Zukausky, Keith E., 4,387,878, Cl. 251-30.000.

Ecanow, Charles S., to NeoMed Corporation. Coacervated iodine. 4,388,302, Cl. 424-150.000.

Eckert, Konrad: *See*—
Leblanc, Jean; Pigeroulet, Jean; Straubel, Max; and Eckert, Konrad, 4,387,686, Cl. 123-446.000.

Eckle, Otto; and Winger, Paul, to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH. Turning head, in particular a facing head. 4,387,612, Cl. 82-2.00E.

Ecodyne Corporation: *See*—
Down, Peter E.; and Salem, Eli, 4,388,417, Cl. 521-26.000.

Edmonston, Donald R.; and Weaver, Frederick R., to Western Electric Company, Inc. Spool assembly. 4,387,863, Cl. 242-118.400.

Eduard Fresenius Chemisch Pharmazeutische Industrie KG: *See*—
Tauschinski, Stefan, 4,387,879, Cl. 251-149.100.

Efamol Limited: *See*—
Horrobin, David F., 4,388,324, Cl. 424-312.000.

Egan, William F., to United States of America, Navy. Loss-of-phase-lock indicator circuit. 4,388,598, Cl. 331-4.000.

Egee, Walter W.; and Rickansrud, David A., to Campbell Soup Company. Heat treatment temperature indicating food package and process for providing same. 4,388,332, Cl. 426-88.000.

Eggleston, Merritt J. Woodstove having exhaust flow compensation and a method for providing same. 4,387,700, Cl. 126-77.000.

Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,387,683, Cl. 123-387.000.

Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,387,688, Cl. 123-502.000.

Eibensteiner, Bruno A.: *See*—
Wiles, Laurence E.; Page, Frank C., III; and Eibensteiner, Bruno A., 4,387,817, Cl. 215-217.000.

Eibl, Johann; Elsinger, Fritz; and Linnau, Yendra, to Immuno Aktiengesellschaft fur Chemisch Medizinische Produkte. Method of producing plasma fractions free of side-effects using fast-reacting antithrombin. 4,388,232, Cl. 260-112.00B.

EIC Laboratories, Inc.: *See*—
Rauh, R. David; and Boudreau, Robert A., 4,388,384, Cl. 429-111.000.

Eichelberger, Charles W.: *See*—
Bedard, James F.; Eichelberger, Charles W.; and Chen, De-Yu, 4,388,566, Cl. 315-291.000.

Eichler, Detlef: *See*—
Wehking, Hans; Eichler, Detlef; and Klingenberg, Wolfgang, 4,388,005, Cl. 400-144.200.

Eickmann, Karl. Fluid motor driven propeller-aircraft for vertical take off and landing with a multipurpose pipe structure. 4,387,866, Cl. 244-7.00C.

Eisenberg, Abraham. Paint roller cleaning system. 4,387,477, Cl. 15-104.920.

Eiwa Chemical Industry Co., Ltd.: *See*—
Murakami, Shinji, 4,388,419, Cl. 521-103.000.

Eka Aktiebolag: *See*—
Sunden, Olof; Batelson, Per G.; Johansson, Hans E.; Larsson, Hans M.; and Svending, Per J., 4,388,150, Cl. 162-175.000.

Ekwall, Carl G. B.: *See*—
Adolfsson, Ebbe S.; Andersson, Kurt H.; and Ekwall, Carl G. B., 4,387,775, Cl. 175-135.000.

Elam Limited: *See*—
Rividi, Jan, 4,388,565, Cl. 315-291.000.

Elbe, Hans-Ludwig; Arold, Hermann; Kranz, Eckart; and Stolzer, Claus, to Bayer Aktiengesellschaft. Preparation of phenoxy-azolyl-butanone derivatives. 4,388,465, Cl. 548-262.000.

Eldridge, David P., to Raytheon Company. Microprogrammable instruction translator. 4,388,682, Cl. 364-200.000.

Electric Power Research Institute: *See*—
Graf, Walter A., Jr.; and Breisch, Robert C., 4,388,273, Cl. 422-117.000.
Jamieson, John M.; and Cleveland, Dixon, 4,387,598, Cl. 73-637.000.

Electro-Sound Inc.: *See*—
Rehklau, George D., 4,387,843, Cl. 226-118.000.

Elektro-Brite GmbH & Co. KG: *See*—
Acimovic, Simeon; Lindemann, Karl-Heinz; and Kunz, Volker G., 4,388,161, Cl. 204-43.00S.

Eli Lilly and Company: *See*—
Lunn, William H. W.; and Wheeler, William J., 4,388,316, Cl. 424-246.000.

Elkay Manufacturing Company: *See*—
Bisonaya, Rudy Y.; and Farrell, Gerald J., 4,387,738, Cl. 137-801.000.

Elliott, Theodore. Wheel steering apparatus for boats. 4,387,658, Cl. 114-144.00R.

Ellis, Ernest W.: *See*—
Borror, Alan L.; and Ellis, Ernest W., 4,388,398, Cl. 430-212.000.

Ellis, James N., to United States of America, Energy. Control system for a wound-rotor motor. 4,388,579, Cl. 318-732.000.

Ellis, Vincent S.; and Mieszkis, Kazimierz W., to Imperial Chemical Industries Limited. Electrically-conductive fibres. 4,388,370, Cl. 428-368.000.

Elsinger, Fritz: *See*—
Eibl, Johann; Elsinger, Fritz; and Linnau, Yendra, 4,388,232, Cl. 260-112.00B.

Emary, Robert J.: *See*—
Gilford, Saul R.; Emary, Robert J.; and Carey, Glen A., 4,387,991, Cl. 356-246.000.

EMI Limited: *See*—
Richards, John W.; and Craven, Ian, 4,388,590, Cl. 324-103.00P.

Eminentverktyg A.B.: *See*—
Nicolin, Curt, 4,387,906, Cl. 279-2.00A.

Emmanuel, Saurabh D., to Machlett Laboratories, Incorporated, The. Soft X-ray lithography system. 4,388,728, Cl. 378-34.000.

Endo, Akinori: *See*—
Kato, Hirokazu; and Endo, Akinori, 4,387,617, Cl. 84-1.010.

Energy Sciences Partners, Ltd.: *See*—
Maes, Michel E.; Shaw, Robert L.; and Reinsch, Royal L., 4,388,254, Cl. 264-3.00C.

Engbert, Theodor: *See*—
Sundermann, Rudolf; Konig, Klaus; Engbert, Theodor; Becker, Gernot; and Hammen, Gunther, 4,388,246, Cl. 260-453.00P.

Engel, Paul R., to Intel Corporation. Method for steam leaching phosphorus from phosphosilicate glass during semiconductor fabrication. 4,388,147, Cl. 156-646.000.

Engelhard Corporation: *See*—
Voss, Kenneth E., 4,387,653, Cl. 110-342.000.

Englar, Robert J.; and Huson, Gregory G., to United States of America, Navy. Mono-element combined supercritical high lift airfoil. 4,387,869, Cl. 244-207.000.

Enjoji, Susumu, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic probe having means for receiving a puncturing cannula therethrough. 4,387,721, Cl. 128-660.000.

Enomae, Satoru, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for feeding billets or the like into a forging press or the like. 4,387,796, Cl. 198-374.000.

Enso-Gutzeit Oy: *See*—
Lumikko, Juha, 4,388,197, Cl. 210-777.000.

Eppler, Richard A., to Mobay Chemical Corporation. Black pigment free of heavy metals. 4,388,118, Cl. 106-306.000.

Epstein, Michael M.: *See*—
Erbstoesser, Steven R.; Cooke, Claude E., Jr.; Sinclair, Richard G.; and Epstein, Michael M., 4,387,769, Cl. 166-295.000.

Erbstoesser, Steven R.; Cooke, Claude E., Jr.; Sinclair, Richard G.; and Epstein, Michael M., to Exxon Production Research Co. Method for reducing the permeability of subterranean formations. 4,387,769, Cl. 166-295.000.

Erickson, David A., to Illinois Tool Works Inc. Swivel connector. 4,388,012, Cl. 403-142.000.

Erie Technological Products, Inc.: *See*—
Chu, Mike S., 4,388,415, Cl. 501-136.000.

Ermolaev, Anatoly V.: *See*—
Gryaznov, Vladimir M.; Karavanov, Andrei N.; Belosljudova, Tamara M.; Ermolaev, Anatoly V.; Maganjuk, Anatoly P.; and Sarycheva, Irina K., 4,388,479, Cl. 568-828.000.

Ernst, Horst M.: *See*—
Brandenstein, Manfred; Ernst, Horst M.; and Walter, Lothar, 4,387,938, Cl. 308-184.00R.

Erwin Kampf GmbH & Co.: *See*—
Kampf, Eberhard, 4,387,861, Cl. 242-75.470.
Erwin Sick Gesellschaft-Optik-Elektronik: *See*—
Walter, Arthur, 4,388,528, Cl. 250-221.000.
Eschem Inc.: *See*—
Schure, Ralph M.; and Steele, Gerald H., 4,388,426, Cl. 523-462.000.
Escher, Gerd; Frohnert, Heinz; and Wenning, Hans-Peter, to Veba Oel Ag. Method and apparatus for distillation of oil shale. 4,388,173, Cl. 208-11.00R.
Escher Wyss GmbH: *See*—
Selder, Harald, 4,387,856, Cl. 241-28.000.
Eskay, Robert R., to Permacel. Repulpable acrylic acid based pressure-sensitive adhesive. 4,388,432, Cl. 524-388.000.
Esselte Pendaflex Corporation: *See*—
Holland-Letz, Gunter; and Dasting, Klaus, 4,387,645, Cl. 101-327.000.
Esser, Hans J.: *See*—
Dunphy, Gerald F.; and Esser, Hans J., 4,387,918, Cl. 292-224.000.
Ethen, John L.; and Bredahl, Timothy D., to Minnesota Mining and Manufacturing Company. Embossed pavement-marking sheet material. 4,388,359, Cl. 428-143.000.
Ethyl Corporation: *See*—
Dagani, Michael J., 4,388,468, Cl. 548-531.000.
Hornbaker, Edwin D.; and Jones, Jesse D., 4,388,446, Cl. 525-175.000.
Ethyl Products Company: *See*—
Wiles, Laurence E.; Page, Frank C., III; and Eibensteiner, Bruno A., 4,387,817, Cl. 215-217.000.
Euteco Impianti S.p.A.: *See*—
Ferlazzo, Natale; Bertolini, Natale; and Ghirga, Marcello, 4,388,223, Cl. 252-437.000.
Evans, Donald J., to Molins Machine Company. Automated web chop-out control for cut-to-mark cut-off machine. 4,387,614, Cl. 83-38.000.
Evans, Orde R., to Oreco III, Inc. Guard for offshore structure. 4,388,025, Cl. 405-212.000.
Excel Industries, Inc.: *See*—
Choby, David; Crawford, James; and Mariel, James, 4,387,923, Cl. 296-201.000.
Exxon Production Research Co.: *See*—
Erbstoesser, Steven R.; Cooke, Claude E., Jr.; Sinclair, Richard G.; and Epstein, Michael M., 4,387,769, Cl. 166-295.000.
Exxon Research and Engineering Co.: *See*—
Bartok, William; Song, Yih H.; Siminski, Vince J.; and Longwell, John P., 4,388,062, Cl. 431-10.000.
Brownawell, Darrell W.; Shaub, Harold; Wisotsky, Max J.; and Gutierrez, Antonio, 4,388,201, Cl. 252-49.600.
Poeppelmeier, Kenneth R.; and Longo, John M., 4,388,294, Cl. 423-599.000.
Ezell, Harry E.; and Ezell, Norwood B. Electrical generating system for vehicles. 4,387,781, Cl. 180-65.00B.
Ezell, Norwood B.: *See*—
Ezell, Harry E.; and Ezell, Norwood B., 4,387,781, Cl. 180-65.00B.
F. L. Smidth & Co.: *See*—
Christiansen, Soren B., 4,388,067, Cl. 432-14.000.
Fabricius, Hans-Ake; and Kottgen, Eckart U., to Shanksville Corporation, N.V. Process for suppressing graft rejection in organ transplantation. 4,388,309, Cl. 424-180.000.
Fadly, Aly M.: *See*—
Nazerian, Keyvan; and Fadly, Aly M., 4,388,298, Cl. 424-89.000.
FAG Kugelfischer Georg Schafer & Co.: *See*—
Fenkner, Max; and Wehner, Hilmar, 4,387,596, Cl. 73-593.000.
Fahey, Robert E. Chair made from a garbage can. 4,387,927, Cl. 297-445.000.
Fairchild Camera & Instrument Corp.: *See*—
Phy, William S., 4,388,525, Cl. 250-211.00J.
Falciani, Marco; and Broggi, Renato, to Dobfar S.p.A. Cephalosporine desacetoxy esters and salts thereof. 4,388,460, Cl. 544-23.000.
Falendysz, Eugene L., Sr.; Brumbaugh, Eldon M.; and North, Max R., to J. I. Case Company. Fixed displacement pump with variable capacitance flow regulator. 4,388,052, Cl. 417-540.000.
Fanson, Richard L.: *See*—
Kennedy, William L.; and Fanson, Richard L., 4,387,580, Cl. 68-12.00R.
Farber, Leon; and Gradeff, Peter S., to Rhone Poulenc Inc. Process for the preparation of p-hydroxy-benzyl-nitriles and corresponding amines. 4,388,250, Cl. 260-465.00F.
Faria, Sixdeniel; and Karam, Ronald E., to Gte Products Corporation. Cadmium sulfide photoconductor blended with light-absorbing material. 4,388,394, Cl. 430-94.000.
Farina, Alfred J.: *See*—
Craig, Laurence B.; and Farina, Alfred J., 4,388,063, Cl. 431-19.000.
Farmitalia Carlo Erba S.p.A.: *See*—
Nannini, Giuliano; Perrone, Ettore; Severino, Dino; Meinardi, Giuseppe; Monti, Gisella; Bianchi, Alberta; Forgione, Angelo; and Confalonieri, Carlo, 4,388,314, Cl. 424-246.000.
Farr, Glyn P. R., to Lucas Industries, Limited. Anti-skid braking systems for vehicles. 4,387,934, Cl. 303-116.000.
Farrell, Gerald J.: *See*—
Bisonaya, Rudy Y.; and Farrell, Gerald J., 4,387,738, Cl. 137-801.000.
Farrier, William D.: *See*—
Campbell, Larry K.; and Farrier, William D., 4,388,533, Cl. 290-1.00R.
Faulconer, Boyd M. Motor vehicle deceleration data acquisition and processing apparatus and methodology. 4,387,587, Cl. 73-9.000.

Fauss, Rudolf: *See*—
Heitkamper, Peter; Konig, Klaus; Fauss, Rudolf; and Findeisen, Kurt, 4,388,238, Cl. 260-239.00E.
Fay, John W., to United States of America, Navy. Optimum flow noise cancelling hydrophone module. 4,388,711, Cl. 367-135.000.
Fechner, Erhard A.: *See*—
Keller, Alex J.; Williams, Joseph R.; Fechner, Erhard A.; and Pinto, Akiva, 4,387,486, Cl. 19-105.000.
Fehrle, Martin: *See*—
Rieder, Werner; and Fehrle, Martin, 4,388,454, Cl. 528-176.000.
Felice, C. Palermo: *See*—
Korpman, Ralf; and Felice, C. Palermo, 4,388,349, Cl. 427-208.400.
Feller, Murray F., to Wilgood Corporation. Heat-meter and flow-meter apparatus. 4,388,003, Cl. 374-41.000.
Feli Products Mfg. Co.: *See*—
Lister, Marc D., 4,387,764, Cl. 165-119.000.
Feltgen, Karlheinz: *See*—
Bueb, Michael; Bruck, Robert; Muschelknautz, Edgar; Paulini, Dieter; and Feltgen, Karlheinz, 4,387,476, Cl. 8-151.200.
Fenkner, Max; and Wehner, Hilmar, to FAG Kugelfischer Georg Schafer & Co. Method of and device for ultrasonically testing spherical bodies. 4,387,596, Cl. 73-593.000.
Ferlazzo, Natale; Bertolini, Natale; and Ghirga, Marcello, to Euteco Impianti S.p.A. Catalyst for the conversion of unsaturated hydrocarbons into diolefins or unsaturated aldehydes and nitriles, and process for preparing the same. 4,388,223, Cl. 252-437.000.
Fernandez, Frank J. Combination back pack and seat. 4,387,924, Cl. 297-188.000.
Fernandez, Ramon B.: *See*—
Shepherd, Gary D.; Fernandez, Ramon B.; and Rule, Ian R., 4,388,289, Cl. 423-447.400.
Ferrero, Mario; and Balestrino, Giovanni, to Centro Ricerche Fiat S.p.A. Electrode tip for electric spot welding. 4,388,516, Cl. 219-119.000.
Fewel, Kenneth J., to Hutson Corporation, The. Vibratory actuator. 4,387,539, Cl. 51-163.200.
Fiat Auto S.p.A.: *See*—
Prato, Luigi, 4,387,536, Cl. 49-502.000.
Ficek, Mieczyslaw: *See*—
Knypl, Maria; Knypl, Eugeniusz; Starzak, Marian; Mieczkowska, Ewa; Pawlus, Urszula; Palubicki, Romuald; Ficek, Mieczyslaw; and Goldynia, Jozef, 4,388,438, Cl. 524-833.000.
Field, A. Kirk; Tytell, Alfred A.; and Lampson, George P., to Merck & Co., Inc. Pharmaceutical composition comprising modified polyriboinosinic-polyribocytidylic acid, for induction of interferon in primates. 4,388,306, Cl. 424-177.000.
Fields, Ellis K.; and Anderson, Ronald L., to Standard Oil Company (Indiana). Certain substituted cyclobutane dicarboxylic acid anhydrides. 4,388,470, Cl. 549-240.000.
Filatov, Alexandr A.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.
Filtrol Corporation: *See*—
Wilson, Geoffrey; and Kayamoto, Masami, 4,388,222, Cl. 252-437.000.
Findeisen, Kurt: *See*—
Heitkamper, Peter; Konig, Klaus; Fauss, Rudolf; and Findeisen, Kurt, 4,388,238, Cl. 260-239.00E.
Finger, Eugene P., to Curtis Instruments, Inc. Battery state of charge indicator operating on bidirectional integraions of terminal voltage. 4,388,618, Cl. 340-636.000.
Finkelmann, Heino; Rehage, Gunther; and Kreuzer, Franz-Heinrich, to Consortium fur Elektrochemische. Crosslinked organopolysiloxanes having liquid-crystalline properties. 4,388,453, Cl. 528-15.000.
Finney, Roy P., to Medical Engineering Corporation. Penile implant. 4,387,705, Cl. 128-1.00R.
Finnigan Corporation: *See*—
Stafford, George C.; and Stephens, David R., 4,388,531, Cl. 250-427.000.
Fiore, Maximillian D.: *See*—
Atlee, John L., III; and Fiore, Maximillian D., 4,387,723, Cl. 128-734.000.
Fireprint AG: *See*—
Viol, Dietmar, 4,387,640, Cl. 101-9.000.
Firestone, Raymond A., to Merck & Co., Inc. Phenyl hydroxypropyl sulfoxide enzyme inhibitors. 4,388,326, Cl. 424-335.000.
Firestone, Raymond A., to Merck & Co., Inc. Allylsulfoxide enzyme inhibitors. 4,388,475, Cl. 564-341.000.
Fischbach, Wolfgang, to Heinrich Baumgarten KG Eisen- und Blechwarenfabrik. Supporting bracket for side handles of utensils. 4,387,484, Cl. 16-114.00A.
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Crosslen, Louis J., 4,387,810, Cl. 211-49.00D.
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Hasebe, Kazunori; and Minagawa, Yoshisato, 4,388,401, Cl. 430-505.000.
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Morigaki, Masakazu; Yagihara, Morio; and Ozawa, Takashi, 4,388,404, Cl. 430-548.000.
Mukunoki, Yasuo; Nakayama, Yasuhiro; and Yokoyama, Shigeki, 4,388,402, Cl. 430-527.000.
Sato, Masamichi, 4,387,984, Cl. 355-12.000.
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Tabei, Masatoshi; Wada, Minoru; Takahashi, Yonosuke; and Yoshida, Satoshi, 4,388,400, Cl. 430-346.000.
Tsuboi, Masayoshi, 4,388,387, Cl. 430-7.000.
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Fuller, David L. Thermosensing article and method of manufacture. 4,388,139, Cl. 156-307.500.
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Ufermann, Werner, 4,388,055, Cl. 425-80.100.
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Gal, Laszlo V., to Rockwell International Corporation. Nucleation bubble generator for bubble domain devices. 4,388,700, Cl. 365-11.000.
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Richardson, Neil R.; and Woodhull, Bradley A., 4,387,572, Cl. 60-602.000.
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Hrivnak, John E.; and Gartland, Robert J., 4,388,356, Cl. 428-35.000.
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Prunty, John, 4,388,263, Cl. 264-257.000.
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Kornbau, Thomas W.; and Sievers, Robert A., 4,388,388, Cl. 430-258.000.
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Bhatnagar, Har S., 4,388,581, Cl. 318-789.000.
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Brown, Ronald H., 4,387,745, Cl. 140-92.100.
Butler, Clyde R., 4,388,706, Cl. 365-226.000.
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West, Jon K.; Catotti, Arthur J.; and Wynn, Michael J., 4,388,120, Cl. 134-15.000.
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Cawdron, Diane, 4,388,337, Cl. 426-573.000.
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Gerteisen, Steven R.; and Wetzel, David R., to Dart Industries Inc. Fiber-reinforced composite materials. 4,388,422, Cl. 523-137.000.
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Gettner, Donald F. Patient handler. 4,387,473, Cl. 5-81.00B.
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Blaisdell, Ronald G.; and Hough, Harold L., 4,388,679, Cl. 362-306.000.
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Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; and Stendel, Wilhelm, 4,388,322, Cl. 424-304.000.
Hammen, Gunther: *See*—
Sundermann, Rudolf; Konig, Klaus; Engbert, Theodor; Becker, Gernot; and Hammen, Gunther, 4,388,246, Cl. 260-453.00P.
Hammer, Edward E., to General Electric Company. Energy saving fluorescent lamp circuit. 4,388,564, Cl. 315-227.00R.
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Hammond, Kenneth G.: *See*—
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Hampson, Robert S.: *See*—
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Hana Biologics, Inc.: *See*—
Yabusaki, Kenichi K., 4,388,412, Cl. 436-536.000.
Hanabusa, Tetsuro: *See*—
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Handy & Harman: *See*—
Stavish, Michael F.; and Reti, Aldo M., 4,388,270, Cl. 420-473.000.
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Hansel, Allen B., to Perkin-Elmer Corporation, The. Fiber optic data link. 4,388,732, Cl. 455-608.000.
Hara, Shigeyoshi: *See*—
Kawaguchi, Takeyuki; Minematsu, Hiroyoshi; Hayashi, Yuzuru; and Hara, Shigeyoshi, 4,388,189, Cl. 210-490.000.
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Deskins, Robert L.; Matlack, Gary L.; and Ashbaugh, Robert D., 4,388,594, Cl. 324-348.000.
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Harford, Jack R., to RCA Corporation. AFT Lockout prevention system. 4,388,649, Cl. 358-195.100.
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King, John A., 4,387,787, Cl. 181-155.000.
Harms, Jack L.: *See*—
Seberg, Charles H.; and Harms, Jack L., 4,388,074, Cl. 604-165.000.
Harper, Lee R.: *See*—
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Harris Corporation: *See*—
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Schwartz, Helmut, 4,388,625, Cl. 343-786.000.
Harris, Matthew E.: *See*—
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Hart, Hiram. Energy-emitting latex-particulates. 4,388,296, Cl. 424-1.000.
Hartl, Roland: *See*—
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Hasegawa, Hiroshi: *See*—
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Hasegawa, Shigekazu, to Hawegawa Chemical Industry Co., Ltd. Porous FRP sheet and manufacturing method thereof. 4,388,365, Cl. 428-258.000.
Hashemifard, Mirahmad. Garden cutting tool. 4,387,510, Cl. 30-314.000.
Hashimoto, Junichiro: *See*—
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Hashimoto, Shunichi: *See*—
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Haskel Engineering & Supply Co.: *See*—
Kelly, John W., 4,387,507, Cl. 29-727.000.
Hassler, Stephen P.; and Sokoly, Theodore O., to McGraw-Edison Company. Current limiting fuse. 4,388,603, Cl. 337-158.000.
Hatanaka, Masayuki: *See*—
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Hatfield, Raymond W., to Ladney, Michael, Jr. Method and apparatus for applying enamels. 4,388,353, Cl. 427-422.000.
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Hawkins, William E., to Du Pont de Nemours, E. I., and Company. Film diversion apparatus. 4,387,841, Cl. 226-97.000.
Hawkins, William G.; and Black, Jerry G., to Xerox Corporation. Laser annealing for growth of single crystal semiconductor areas. 4,388,145, Cl. 156-617.00R.
Hawkinson, Paul E.: *See*—
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Hayama, Masashi: *See*—
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Hayman, Richard W.; Goldstein, Burton; Lynn, Joe J.; Brown, Robert J.; and Bugash, Robert S., to OCR Marketing Associates, Inc. Restaurant video display system. 4,388,689, Cl. 364-401.000.
Hazeltine Corporation: *See*—
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Hazen, David R.: *See*—
Jamison, Will B.; and Hazen, David R., 4,387,798, Cl. 198-587.000.
Hedlund, Lee V.; Herzog, Donald G.; and Putzrath, Franz L., to RCA Corporation. Search-mode arrangement for VTR. 4,388,657, Cl. 360-72.100.
Hedstrom, Mark D., to Delta Promotions, Inc. Electronic insect killer. 4,387,529, Cl. 43-112.000.
Heiberger, Francis E., to Danly Machine Corporation. Control system for synchronizing power presses and associated feed mechanism with interlock features. 4,387,632, Cl. 100-45.000.
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Jeschke, Willi; Junghans, Rudi; Beisel, Hermann; and Hofmann, Gunther, 4,387,648, Cl. 101-365.000.
Heinemann, Joseph B., to Timeplex, Inc. Hardware memory write lock circuit. 4,388,695, Cl. 364-900.000.
Heinrich Baumgarten KG Eisen- und Blechwarenfabrik: *See*—
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Heinrich Wemhoner GmbH & Co. KG: *See*—
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Heitkamper, Peter; Konig, Klaus; Fauss, Rudolf; and Findeisen, Kurt, to Bayer Aktiengesellschaft. Process for the preparation of N,O-disubstituted urethanes suitable as a starting material for the preparation of isocyanates. 4,388,238, Cl. 260-239.00E.
Heller, Adam, to Bell Telephone Laboratories, Incorporated. Devices having chemically modified p-type InP surfaces. 4,388,383, Cl. 429-111.000.
Helling, Gunter; Reiff, Helmut; Himmelmann, Wolfgang; and Renner, Gunter, to Agfa-Gevaert Aktiengesellschaft. Process for the preparation of dispersions of hydrophobic substances in water. 4,388,403, Cl. 430-546.000.
Hellqvist, Ake O. V., to Cinderella AB. Process and a device for purifying water. 4,388,192, Cl. 210-615.000.
Hembert, Gaetan, to Lucas Industries Limited. Electrical harness forming machine. 4,388,142, Cl. 156-446.000.
Hembre, Robert T.; and Cook, Steven L., to Eastman Kodak Company. Process for the recovery of catalyst values. 4,388,217, Cl. 252-413.000.
Henderson, Richard E. L.: *See*—
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Rogier, Edgar R., 4,388,209, Cl. 252-182.000.
Henry, Michael F., to General Electric Company. Cyclic oxidation-hot corrosion resistant nickel-base superalloys. 4,388,124, Cl. 148-404.000.
Herbert, Roger P., to Smith International, Inc. Time recorder for in-hole motors. 4,387,774, Cl. 175-40.000.
Hercules Incorporated: *See*—
Maslanka, William W., 4,388,439, Cl. 524-845.000.
Hermening, Helmut; Monden, Norbert; Schaar, Lothar; Schneider, Wilhelm; and Seidel, Hans-Georg, to Heye, Hermann. Pressurized fluid distributing arrangement for a forming tool for shaping thermoplastic material. 4,388,099, Cl. 65-267.000.
Herriau, Paul, to Societe Sogefina, Societe de Gestion Financiere Armoricaine. Precision sowing seed drill. 4,387,656, Cl. 111-86.000.
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Herzog, Donald G.: *See*—
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Hess, Larry W.: *See*—
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Hetz, Heinz K., to YWHC, Inc. Steam trap including interchangeable body member and insert assembly. 4,387,732, Cl. 137-183.000.
Heubl, Walter. Closure for cans provided with beaded edge. 4,387,826, Cl. 220-243.000.
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Lovelock, James E., 4,388,411, Cl. 436-149.000.
Miller, David G., 4,387,720, Cl. 128-660.000.
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Hidaka, Hiroshi: *See*—
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Hiestand, Karl, to SMW Schneider & Weisshaupt GmbH. Device for controlling a working machine. 4,387,907, Cl. 279-4.000.
Higo, Moriaki: *See*—
Suzuki, Shin-ichi; Kitoh, Shinya; Toda, Haruhiko; and Higo, Moriaki, 4,388,421, Cl. 523-118.000.
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Hill, Raymond R. Stethoscope with improved resonant cavity amplification. 4,387,784, Cl. 181-131.000.
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Himmelmann, Wolfgang: *See*—
Helling, Gunter; Reiff, Helmut; Himmelmann, Wolfgang; and Renner, Gunter, 4,388,403, Cl. 430-546.000.
Hirahata, Shigeru: *See*—
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Hirao, Shozo; Saihara, Yasuhiro; Nakanishi, Toshio; Ihara, Ichiro; and **Sano, Yoshio,** to Matsushita Electric Works, Ltd. Method of manufacturing artificial wood veneer. 4,388,133, Cl. 156-245.000.
Hitachi, Ltd.: *See*—
Awazuhara, Hiroshi; Tsumura, Sukebumi; and Kimura, Tomoaki, 4,387,586, Cl. 72-206.000.
Horiuchi, Michimasa; Ibamoto, Masahiko; and Nemoto, Kiyoshi, 4,388,573, Cl. 318-376.000.
Koike, Norio; Sasano, Akira; Taniguchi, Yoshio; Nakano, Toshio; Aoki, Masakazu; and Takemoto, Iwao, 4,387,987, Cl. 355-133.000.
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Komatsu, Shigeru; Mizukami, Kazushi; Tachiuchi, Tsuguji; Nagai, Kunihiko; and Koyama, Takuo, 4,388,707, Cl. 365-230.000.
Ohta, Yoshihiro; and Ichikawa, Akira, 4,388,491, Cl. 179-1.0SC.
Sakamoto, Masakatsu; Uchida, Kenji; and Nagano, Shuichi, 4,387,595, Cl. 73-322.500.
Suzuki, Takaya; Inoue, Yosuke; and Aoyama, Takashi, 4,388,342, Cl. 427-8.000.
Takagi, Katsuaki; and Kita, Yuzo, 4,388,612, Cl. 340-347.0DA.
Watanabe, Atsuo; Naito, Masayoshi; Yatsuo, Tsutomu; and Okamura, Masahiro, 4,388,635, Cl. 357-38.000.
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Takao, Kengo; Ohmachi, Mineo; Kihara, Hisatsugu; Toki, Kenshiro; Tomita, Yukio; and Mizota, Toshihiro, 4,387,562, Cl. 60-39.150.
Terauchi, Kazuo; and Fukata, Masatoshi, 4,387,659, Cl. 114-199.000.
Hitchcock, Myron H., to Interstate Electronics Corporation. Speech recognition microcomputer. 4,388,495, Cl. 179-1.0SD.
Hitco: *See*—
Shepherd, Gary D.; Fernandez, Ramon B.; and Rule, Ian R., 4,388,289, Cl. 423-447.400.
Hochiki Corporation: *See*—
Machida, Haruchika, 4,388,616, Cl. 340-587.000.
Hochstein, Waldheim; Kaibel, Gerd; Mueller, Franz-Josef; and **Hartmann, Horst,** to BASF Aktiengesellschaft. Isolation of acetaldehyde and methanol from reaction mixtures resulting from the homologization of methanol. 4,388,154, Cl. 203-35.000.
Hodgkins, Harry L.: *See*—
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Hoechst Aktiengesellschaft: *See*—
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Schell, Loni, 4,388,391, Cl. 430-49.000.
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Hoerauf, Werner: *See*—
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Hoffman, Stephen A.: *See*—
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Hoffmann-La Roche Inc.: *See*—
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Horecker, Bernard L., 4,388,234, Cl. 260-112.50R.
Stein, Stanley, 4,388,236, Cl. 260-112.50R.
Trybulski, Eugene J., 4,388,239, Cl. 260-239.0BB.
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Jeschke, Willi; Junghans, Rudi; Beisel, Hermann; and Hofmann, Gunther, 4,387,648, Cl. 101-365.000.
Hoge, Carl E.; and **Lin, Gregory K.,** to Burroughs Corporation. Method of attaching a protective film to an integrated circuit. 4,388,132, Cl. 156-153.000.
Hogue, Norman E., to Packard Industries, Inc. Latch for a tab and slot mounting bracket. 4,387,872, Cl. 248-221.300.
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United States of America, National Aeronautics and Space Administration; Lee, Ja H.; and Hohl, Frank, 4,388,542, Cl. 310-11.000.
Hokushin Electric Works, Ltd.: *See*—
Azegami, Tadashi, 4,387,601, Cl. 73-724.000.
Holland-Letz, Gunter; and **Dasting, Klaus,** to Esselte Pendaflex Corporation. Printing mechanism. 4,387,645, Cl. 101-327.000.
Holly, Sandor, to Rockwell International Corporation. Wide bandwidth optical modal deformation sensor. 4,387,966, Cl. 350-360.000.
Holstein und Kappert GmbH: *See*—
Rademacher, Friedrich, 4,387,797, Cl. 198-461.000.
Holt Lloyd S.A.: *See*—
Guerrier, Jean, 4,387,677, Cl. 123-179.00L.
Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; and **Dewert, Heribert.** Noxious-component removal from flue gas and compositions useful therefor. 4,388,281, Cl. 423-210.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hamane, Masumi; Shigihara, Akira; and Kato, Masaie, 4,387,606, Cl. 74-752.00E.
Otani, Junji; and Ikenoya, Yasuo, 4,387,565, Cl. 60-293.000.
Honegger, Heinz, to Honel Holding AG, Ltd., SA. Drainage device embedded in a concrete slab for moisture drainage. 4,388,015, Cl. 404-2.000.
Honel Holding AG, Ltd., SA: *See*—
Honegger, Heinz, 4,388,015, Cl. 404-2.000.
Honeywell Inc.: *See*—
Benton, Ronald, 4,387,763, Cl. 165-29.000.
Honeywell Information Systems Inc.: *See*—
Hall, Roger L.; and Conroy, Walter J., 4,387,951, Cl. 339-193.00R.
Hall, Roger L.; and Romano, Domenic R., 4,388,671, Cl. 361-383.000.
Nibby, Chester M., Jr.; and Johnson, Robert B., 4,388,684, Cl. 364-200.000.
Twibell, Jerome J.; and Johnston, Robert J., 4,388,687, Cl. 364-200.000.
Honsinger, Vernon B.; and **Tompkins, Russell E.,** to General Electric Company. Rotor for a permanent magnet AC motor. 4,388,545, Cl. 310-156.000.
Hoover, Merle L., deceased (by Hoover, Nancy S., executrix), to Joy Manufacturing Company. Conveyor belt. 4,387,801, Cl. 198-821.000.
Hoover, Nancy S., executrix: *See*—
Hoover, Merle L., deceased, 4,387,801, Cl. 198-821.000.
Hoppel, Rainer, to Robert Bosch GmbH. Control apparatus for a fuel metering system in an internal combustion engine. 4,387,687, Cl. 123-493.000.
Hoppel, Rainer; and **Knapp, Heinrich,** to Robert Bosch GmbH. Fuel injection apparatus. 4,387,695, Cl. 123-585.000.
Hopper, Michael J.; Martin, Michael R.; Bolt, Lawrence; Smith, Michael; and **Tavasolian, Ali,** to American Hoechst Corporation. Polyester based polarizer. 4,388,375, Cl. 428-423.700.
Hoquet, Robert G.: *See*—
Thomas, Thomas J.; and Hoquet, Robert G., 4,388,078, Cl. 8-514.000.
Horecker, Bernard L., to Hoffmann-La Roche Inc. Peptide isolation. 4,388,234, Cl. 260-112.50R.
Horgan, John J.: *See*—
Hamilton, Stuart; and Horgan, John J., 4,387,560, Cl. 60-39.020.
Hori, Takanobu; Arai, Fuminao; Kodama, Hisashi; and **Okabe, Yoshio,** to Aisin Seiki Kabushiki Kaisha. Engine valve actuating mechanism having a hydraulic fulcrum lifting device. 4,387,675, Cl. 123-90.580.
Horiba, Ltd.: *See*—
Tanimoto, Masahiro, 4,388,722, Cl. 373-118.000.
Horibe, Kyoichi: *See*—
Sugiura, Shinji; and Horibe, Kyoichi, 4,388,445, Cl. 525-124.000.
Horikawa, Masao: *See*—
Murai, Wasaburo; and Horikawa, Masao, 4,388,506, Cl. 200-144.00R.
Horiuchi, Michimasa; Ibamoto, Masahiko; and **Nemoto, Kiyoshi,** to Hitachi, Ltd. Electric vehicle control device. 4,388,573, Cl. 318-376.000.
Hornbaker, Edwin D.; and **Jones, Jesse D.,** to Ethyl Corporation. Polyethylene terephthalate blends. 4,388,446, Cl. 525-175.000.
Horner, Joseph L.: *See*—
Ludman, Jacques E.; Horner, Joseph L.; and Mikes, Thomas L., 4,387,955, Cl. 350-96.190.
Horrobin, David F., to Efamol Limited. Pharmaceutical and dietary composition. 4,388,324, Cl. 424-312.000.
Horsma, David A.: *See*—
Toy, Lester T.; Moyer, Wendell W.; Lyons, Bernard J.; and Horsma, David A., 4,388,607, Cl. 338-22.0SD.
Hort, Eugene V.; Anderson, Lowell R.; and **Alwani, Dru W.,** to GAF Corporation. Corrosion inhibitors. 4,388,206, Cl. 252-148.000.
Hosegood, Edward A.: *See*—
Champaneria, Nitin J.; Harper, Lee R.; and Hosegood, Edward A., 4,388,372, Cl. 428-395.000.
Hosono, Nagao; Kinoshita, Koichi; and **Takahashi, Toru,** to Canon Kabushiki Kaisha. Developing apparatus for electrostatic image. 4,387,664, Cl. 118-658.000.

Hough, Harold L.: *See*—
Blaisdell, Ronald G.; and Hough, Harold L., 4,388,679, Cl. 362-306.000.
Houldsworth, John, to Chesseli Limited. Chart recorder. 4,388,631, Cl. 346-141.000.
House, Cynthia B.; and Leichti, Robert J., to United States Gypsum Company. Thermoplastic hardboard from acetylated mat. 4,388,378, Cl. 428-537.000.
Howard, Peter B.; Boelitz, Martin V.; and De Swarte, Thomas W., to United States of America, Navy. Method for steering a solid propellant ballistic vehicle. 4,387,865, Cl. 244-3.100.
HPM Corporation: *See*—
Bishop, Thomas G., 4,387,834, Cl. 222-278.000.
Hrivnak, John E.; and Gartland, Robert J., to Goodyear Tire & Rubber Company, The. Heat setting a thermoformed PET article utilizing a male plug as a constraint. 4,388,356, Cl. 428-35.000.
Hruda, Robert M.; and Cusimano, John L., to Westinghouse Electric Corp. Switch operating means including latching means maintaining switch contacts open or closed. 4,388,504, Cl. 200-76.000.
Hsu, Fu-Lian: *See*—
Brossi, Arnold; Schmidhammer, Helmut; Jacobson, Arthur E.; and Hsu, Fu-Lian, 4,388,463, Cl. 546-74.000.
Hsu, Herbert H.; and Tan-Hsu, Inri. Retainer for surgeon's eye glasses. 4,387,471, Cl. 2-10.000.
Hudson, H. Gene. Mineral separation by particle settling characteristics. 4,388,182, Cl. 209-17.000.
Hughes Aircraft Company: *See*—
Robinson, William P.; McNulty, Hugh, Jr.; Seliger, Robert L.; and Williamson, Weldon S., 4,388,560, Cl. 315-111.810.
Turk, Roger R.; and Robinson, Morton, 4,388,097, Cl. 65-64.000.
Vasudev, Prahalad K., 4,388,633, Cl. 357-17.000.
Hughes, Howard C., Jr.: *See*—
Brownlee, Robert R.; Hughes, Howard C., Jr.; Neff, Paul H.; and Tyers, G. Frank O., 4,387,717, Cl. 128-419.0PG.
Hughes, William L., to Commercial Resins Company. Heating collar with quadrafilar windings. 4,388,510, Cl. 219-8.500.
Huie, Jaken Y.; and Jacobus, Dan, to Sperry Corporation. Method of making a polyimide/glass hybrid printed circuit board. 4,388,136, Cl. 156-252.000.
Hungerford, Gordon P., to Mobil Oil Corporation. Polymer film coated with aqueous polymer. 4,388,258, Cl. 264-129.000.
Hunt, Albert H.: *See*—
Bickley, Robert H.; and Hunt, Albert H., 4,388,597, Cl. 331-2.000.
Hunt, Milby N. Vehicle traction device. 4,387,930, Cl. 301-46.000.
Hunter, James R.: *See*—
Klipsch, Paul W.; and Hunter, James R., 4,387,786, Cl. 181-150.000.
Huson, Gregory G.: *See*—
Englar, Robert J.; and Huson, Gregory G., 4,387,869, Cl. 244-207.000.
Hutson Corporation, The: *See*—
Fewel, Kenneth J., 4,387,539, Cl. 51-163.200.
Hwang, Bruce Y.: *See*—
Dewey, Richard H.; Hwang, Bruce Y.; and Kuo, George Y., 4,388,240, Cl. 260-239.0BB.
Hy-Way Heat Systems, Inc.: *See*—
Miller, John H., 4,387,766, Cl. 165-172.000.
Hydro-Quebec: *See*—
Chamberland, Andre M.; and Gauthier, Michel, 4,388,155, Cl. 204-1.00T.
Hydrovane Compressor Company Limited: *See*—
Boller, Edward, 4,388,046, Cl. 417-295.000.
Hylsa, S.A.: *See*—
Carrillo-Cantu, David H.; and Trevino-Alanis, Asdrubal, 4,388,116, Cl. 106-97.000.
Hyltin, Tom M., to Commodore Electronics, Ltd. Solid-state fluorescent lamp ballast. 4,388,563, Cl. 315-205.000.
Hynst, Karel; and Travnicek, Mojmir, to ZVS-Adamovske strojirny, koncernovy podnik. Device for increasing the ink supply to the inking unit of a printing machine. 4,387,646, Cl. 101-350.000.
Ibamoto, Masahiko: *See*—
Horiuchi, Michimasa; Ibamoto, Masahiko; and Nemoto, Kiyoshi, 4,388,573, Cl. 318-376.000.
ICD Corporation: *See*—
Suimon, Yoshio, 4,387,532, Cl. 46-254.000.
Ichikawa, Akira: *See*—
Ohta, Yoshihiro; and Ichikawa, Akira, 4,388,491, Cl. 179-1.0SC.
Ide, Akira: *See*—
Ueyanagi, Kaoru; Ide, Akira; Kato, Masaaki; and Komatsu, Kazuro, 4,388,245, Cl. 260-453.0AB.
Igelbuscher, Heinrich: *See*—
Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; and Dewert, Heribert, 4,388,281, Cl. 423-210.000.
Ignell, Rolf L., to Tetra Pak Developpement SA. Closing arrangement for packing containers. 4,387,820, Cl. 215-320.000.
Ihara, Ichiro: *See*—
Hirao, Shozo; Saihara, Yasuhiro; Nakanishi, Toshio; Ihara, Ichiro; and Sano, Yoshio, 4,388,133, Cl. 156-245.000.
Ihara, Keisaku: *See*—
Ishida, Hideo; Kitada, Masashi; and Ihara, Keisaku, 4,388,215, Cl. 252-402.000.
IHC Holland N.V.: *See*—
Loevendie, Rudolf H., 4,387,519, Cl. 37-195.000.
Iida, Kazuyoshi: *See*—
Nishikawa, Syuzi; Matsubara, Toru; Iida, Kazuyoshi; and Tahara, Seiichiro, 4,388,427, Cl. 523-500.000.
Ikeda, Hiroaki, to Nippon Electric Co., Ltd. Delay signal generating circuit. 4,388,538, Cl. 307-482.000.
Ikeda, Tomoaki: *See*—
Shinozaki, Fumiaki; Namiki, Tomizo; and Ikeda, Tomoaki, 4,388,399, Cl. 430-271.000.
Ikegami, Hiroshi: *See*—
Nagira, Norichika; Ikegami, Hiroshi; Baba, Hiroji; and Yahano, Kanji, 4,388,169, Cl. 204-207.000.
Ikegami, Mikihiko: *See*—
Ogawa, Masaki; and Ikegami, Mikihiko, 4,387,756, Cl. 152-209.00R.
Ogawa, Masaki; and Ikegami, Mikihiko, 4,387,757, Cl. 152-209.00R.
Ikemizu, Naoyuki, to Toyo Kogyo Co., Ltd. Moldings for vehicle body structure. 4,388,355, Cl. 428-31.000.
Ikenoya, Yasuo: *See*—
Otani, Junji; and Ikenoya, Yasuo, 4,387,565, Cl. 60-293.000.
Ikeura, Kenji; and Morita, Tatsuo, to Nissan Motor Company, Limited. Fuel supply control system for an internal combustion engine. 4,387,681, Cl. 123-325.000.
Ilardo, Charles S.; and Scharf, Daniel J., to Occidental Chemical Corporation. Flame retardant polymer compositions. 4,388,429, Cl. 524-94.000.
Illinois Tool Works Inc.: *See*—
Erickson, David A., 4,388,012, Cl. 403-142.000.
Imai, Hirosuke; Matsuno, Mitsuo; and Kudoh, Michio, to Nippon Oil Co., Ltd. Process for preparing 4-methyl-1-pentene. 4,388,480, Cl. 585-516.000.
Imai, Shinichi: *See*—
Sugiyama, Masatoshi; Ogawa, Akira; and Imai, Shinichi, 4,388,115, Cl. 106-22.000.
Imamura, Noriaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Mechanical parking brake mechanism. 4,387,792, Cl. 188-328.000.
Immuno Aktiengesellschaft fur Chemisch Medizinische Produkte: *See*—
Eibl, Johann; Elsinger, Fritz; and Linnau, Yendra, 4,388,232, Cl. 260-112.00B.
Immuno Concepts, Inc.: *See*—
Valencia, Donald W., 4,387,972, Cl. 350-536.000.
Imperial Chemical Industries Limited: *See*—
Brown, James P.; Gibbins, Graham; and Hampson, Robert S., 4,388,138, Cl. 156-289.000.
Ellis, Vincent S.; and Mieszkis, Kazimierz W., 4,388,370, Cl. 428-368.000.
Hartshorn, Angus J.; Jones, Eric; and Segal, John A., 4,388,220, Cl. 252-429.00B.
Imperial Chemical Industries PLC: *See*—
Cartwright, David; and Collins, David J., 4,388,472, Cl. 560-21.000.
Rowe, Frederick, 4,388,218, Cl. 252-417.000.
Inada, Koichi: *See*—
Takahashi, Shiro; Sanada, Kazuo; Inada, Koichi; and Fukuda, Osamu, 4,388,098, Cl. 65-157.000.
Inman, Darrel F., to Omark Industries, Inc. Plated jacket soft point bullet. 4,387,492, Cl. 29-1.230.
Inoue, Yosuke: *See*—
Suzuki, Takaya; Inoue, Yosuke; and Aoyama, Takashi, 4,388,342, Cl. 427-8.000.
Institute of Gas Technology: *See*—
Sammells, Anthony F.; and St. John, Michael R., 4,388,162, Cl. 204-78.000.
Institutet for Verkstadsteknisk Forskning: *See*—
Abbestam, Kaj; and Palmers, Goran, 4,387,635, Cl. 100-214.000.
Intel Corporation: *See*—
Engel, Paul R., 4,388,147, Cl. 156-646.000.
International Business Machines Corp.: *See*—
Aichelmann, Frederick J., Jr.; and Neves, Fernando, 4,388,701, Cl. 365-77.000.
Beck, Vernon D., 4,388,619, Cl. 340-727.000.
Bertin, Claude L.; Kotecha, Harish N.; and Wiedman, Francis W., 4,388,704, Cl. 365-154.000.
Brown, Charles R.; Kohne, Theodore J.; and Lancto, Donald C., 4,387,639, Cl. 101-2.000.
Curlee, Thomas O., III; and Richardson, Ethel L., 4,388,688, Cl. 364-200.000.
Kellogg, Robert M.; and Mulzet, Alfred P., 4,387,848, Cl. 494-81.000.
King, Bruce D.; and Levin, James P., 4,388,386, Cl. 430-5.000.
Mott, William E.; and Shakib, Iraj D., 4,388,010, Cl. 400-692.000.
Schroeder, Eugene N., 4,388,526, Cl. 250-214.00R.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,388,228, Cl. 252-522.00R.
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,388,207, Cl. 252-174.110.
Van Loveren, Augustinus G.; Munteanu, Marina A.; and Seaber, Geoffrey B., 4,387,849, Cl. 239-6.000.
International Nickel Company, Inc., The: *See*—
Benn, Raymond C., 4,388,125, Cl. 148-428.000.
International Plant Research Institute, Inc.: *See*—
Pappo, Raphael; and Otteson, Kenneth M., 4,388,462, Cl. 546-14.000.
International Telephone and Telegraph Corporation: *See*—
Burke, Michael G., 4,388,717, Cl. 370-62.000.
Moore, William C., 4,388,680, Cl. 362-368.000.
Schiffmann, Robert F.; Mirman, Alfred H.; Grillo, Richard J.; and Batey, Robert W., 4,388,335, Cl. 426-243.000.

InterNorth, Inc.: *See*—
Moseman, Merlin H., 4,387,593, Cl. 73-290.00R.

Interstate Electronics Corporation: *See*—
Hitchcock, Myron H., 4,388,495, Cl. 179-1.0SD.

Inui, Tsuneo; Kuroda, Hitoshi; Hanabusa, Tetsuro; and Yazaki, Katsuhito, to Toyo Kohan Company, Ltd. Acidic tinplating process and process for producing an iron-tin alloy on the surface of a steel sheet. 4,388,158, Cl. 204-27.000.

Io, Yukito: *See*—
Seki, Masahiko; Wada, Koji; and Io, Yukito, 4,387,884, Cl. 266-246.000.

Ioffe, Jury S.: *See*—
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.

Iowa Engineered Processes Corp.: *See*—
Roach, Maurice P.; Burkhart, Russell D.; and Meehan, James B., 4,387,537, Cl. 51-17.000.

Ireland, Ralph, to Dayton Rogers Manufacturing Co. Sheet metal shear. 4,387,616, Cl. 83-608.000.

Irvin, Howard B., to Phillips Petroleum Company. Preparing blends of a synthetic rubber with a poly(arylene oxide) by distillative displacement. 4,388,444, Cl. 525-92.000.

Ishida, Hideo; Kitada, Masashi; and Ihara, Keisaku, to Sanyo Mokuzai Bofu Kabushiki Kaisha. Wood preservative composition. 4,388,215, Cl. 252-402.000.

Ishida, Masamichi; Kamo, Jun; Takemura, Toru; Minami, Shunsuke; and Kamada, Kensuke. Process for manufacturing regenerated cellulose hollow fiber. 4,388,256, Cl. 264-41.000.

Ishida, Yuzuru: *See*—
Iwamoto, Mune; Ito, Norifumi; Ishida, Yuzuru; Furuta, Yasuo; and Matsubara, Tetsuyuki, 4,388,447, Cl. 525-316.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Takeuchi, Osamu; Hasegawa, Hiroshi; Izumi, Susumu; and Otsuki, Naoki, 4,388,068, Cl. 432-122.000.

Ishimaru, Kenji: *See*—
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, 4,388,243, Cl. 260-397.200.

Ishizawa, Tadao, to Kabushiki Kaisha Daini Seikosha. Magnetic bearing for high-speed rotation. 4,387,936, Cl. 308-10.000.

Ishman, Neal H.; Buxton, Robert B.; Durst, Duane A.; McArthur, James F.; and Johnson, Michael E., to E-Systems, Inc. Apparatus for monitoring a multichannel receiver. 4,388,644, Cl. 358-84.000.

Isovolta Osterreichische Isolierstoffwerke: *See*—
Rieder, Werner; and Fehrle, Martin, 4,388,454, Cl. 528-176.000.

Istituto Sieroterapico e Vaccinogeno Toscano "Sclavo" S.p.A.: *See*—
Cocola, Francesco; Tarli, Paolo; and Neri, Paolo, 4,388,295, Cl. 424-1.000.

Itek Corporation: *See*—
Magin, Irving J.; and Nelson, Erik K., 4,387,985, Cl. 355-71.000.

Itnoc Dairy Cap Co. Inc.: *See*—
Conti, Vincent N., 4,387,818, Cl. 215-256.000.

Ito, Norifumi: *See*—
Iwamoto, Mune; Ito, Norifumi; Ishida, Yuzuru; Furuta, Yasuo; and Matsubara, Tetsuyuki, 4,388,447, Cl. 525-316.000.

Itou, Kouichi: *See*—
Taniguchi, Yasuo; Asano, Toshio; Funami, Haruo; and Itou, Kouichi, 4,388,442, Cl. 525-60.000.

ITW Limited: *See*—
Blackburn, Neil P.; Piper, Alfred E. C.; and Meeks, Alan M. G., 4,387,490, Cl. 24-200.000.

Iwamoto, Kenji; and Kuroyanagi, Makoto, to Nippon Soken, Inc. Internal combustion engine with supercharger. 4,387,570, Cl. 60-600.000.

Iwamoto, Mune; Ito, Norifumi; Ishida, Yuzuru; Furuta, Yasuo; and Matsubara, Tetsuyuki, to Mitsui Toatsu Chemicals, Inc. Process for producing rubber modified styrene resins. 4,388,447, Cl. 525-316.000.

Iwata, Susumu; Maruta, Keiichi; and Yuyama, Yukihiro, to Ricoh Co., Ltd. Released heat-sensitive recording paper. 4,388,362, Cl. 428-211.000.

Izumi, Susumu: *See*—
Takeuchi, Osamu; Hasegawa, Hiroshi; Izumi, Susumu; and Otsuki, Naoki, 4,388,068, Cl. 432-122.000.

J. B. Two Corporation: *See*—
Barker, Joel A.; and Birch, Jeffrey, 4,387,925, Cl. 297-201.000.

J. I. Case Company: *See*—
Falendysz, Eugene L., Sr.; Brumbaugh, Eldon M.; and North, Max R., 4,388,052, Cl. 417-540.000.

Jackson, Patrick L. Glove-mounted wrist watch. 4,387,838, Cl. 224-170.000.

Jacob, Bart M. Friction type game call. 4,387,531, Cl. 46-189.000.

Jacobsen, James H.: *See*—
Sneed, Robert C., Jr.; MacNaughton, Robert G.; and Jacobsen, James H., 4,388,601, Cl. 333-227.000.

Jacobsen, Kjell M., to PLM Aktiebolag. Plastic containers for storage of goods under pressure. 4,387,815, Cl. 215-1.00C.

Jacobson, Arthur E.: *See*—
Brossi, Arnold; Schmidhammer, Helmut; Jacobson, Arthur E.; and Hsu, Fu-Lian, 4,388,463, Cl. 546-74.000.

Jacobus, Dan: *See*—
Huie, Jaken Y.; and Jacobus, Dan, 4,388,136, Cl. 156-252.000.

Jagenberg-Werke AG: *See*—
Buchholz, Rainer; Mohn, Hans-Werner; Boms, Hermann; and Zodrow, Rudolf, 4,388,143, Cl. 156-475.000.

James G. Brown & Associates, Inc.: *See*—
Dysarz, Edward D., 4,388,024, Cl. 405-198.000.

Jamieson, John M.; and Cleveland, Dixon, to Electric Power Research Institute. Pipe scanner mechanism. 4,387,598, Cl. 73-637.000.

Jamison, Will B.; and Hazen, David R., to Consolidation Coal Company. Cascading conveyor system. 4,387,798, Cl. 198-587.000.

Janikowski, Daniel S.: *See*—
Shum, Ming S.; Janikowski, Daniel S.; and Bradley, Steven A., 4,388,347, Cl. 427-96.000.

Janssen, Daniel J. G., to U.S. Philips Corporation. Line interruption circuit for use in a telephone set. 4,388,499, Cl. 179-81.00R.

Janssen, Daniel J. G.: *See*—
Geboers, Josephus J. A.; and Janssen, Daniel J. G., 4,388,498, Cl. 179-81.00R.

Jarvis, Robert D. Air filter for a cooling system overflow container. 4,387,671, Cl. 123-41.270.

Javeri, Rupin J., to Motorola Inc. Ignition advance circuit with sensor inputs. 4,387,684, Cl. 123-416.000.

Jeffers, Frederick; and McClure, Richard J., to Eastman Kodak Company. Thin film magnetoresistive head. 4,388,662, Cl. 360-113.000.

Jenkins, Raymond F.: *See*—
Swift, Graham; Cenci, Harry J.; and Jenkins, Raymond F., 4,388,434, Cl. 524-476.000.

Jenkins, William A., to Monarch Marking Systems, Inc. Flexible endless printing band. 4,387,644, Cl. 101-111.000.

Jensen, Ole R., to E. R. Squibb & Sons, Inc. Method of manufacturing ostomy pouches. 4,388,135, Cl. 156-250.000.

Jensfelt, Torsten E.; and Petersson, Stig A., to Boliden Aktiebolag. Method for recovering the metal content of complex sulphidic metal raw materials. 4,388,110, Cl. 75-21.000.

Jeschke, Willi; Junghans, Rudi; Beisel, Hermann; and Hofmann, Gunther, to Heidelberger Druckmaschinen AG. Ink metering with individual ink knives respectively extending over the entire width of the inking zones. 4,387,648, Cl. 101-365.000.

Jewell, Walter E. B.; and Patarcity, Adam J., to Kennecott Corporation. Fluorocarbon polymer gasket and method of manufacturing such. 4,388,259, Cl. 264-153.000.

Jobes, Orin, Jr.: *See*—
Lee, Franky B.; and Jobes, Orin, Jr., 4,388,056, Cl. 425-83.100.

Johansen, Jack T., to De Forenede Bryggerier A/S. Process for isolating Cu,Zn-superoxide dismutase from aqueous solutions containing said enzyme together with accompanying proteins. 4,388,406, Cl. 435-189.000.

Johansson, Hans E.: *See*—
Sunden, Olof; Batelson, Per G.; Johansson, Hans E.; Larsson, Hans M.; and Svending, Per J., 4,388,150, Cl. 162-175.000.

Johnson, Arthur D., to Wells Manufacturing Corporation. Spark plug wire terminal and method for attaching terminal. 4,387,948, Cl. 339-97.00R.

Johnson, Bobby L.: *See*—
Folger, Philip M.; and Johnson, Bobby L., 4,387,679, Cl. 123-198.00D.

Johnson, Craig; Dendor, Paul; and Hodgkins, Harry L., to United States of America, Navy. Multi-component propellant charges. 4,388,126, Cl. 149-14.000.

Johnson, David D.: *See*—
Biller, Cleveland J.; and Johnson, David D., 4,387,812, Cl. 212-176.000.

Johnson & Johnson Baby Products Company: *See*—
Mesek, Frederick K.; and Mesek, Virginia R., 4,388,075, Cl. 604-385.000.
Mesek, Frederick K.; and Mesek, Virginia R., 4,388,075, Cl. 604-385.000.

Johnson, Michael E.: *See*—
Ishman, Neal H.; Buxton, Robert B.; Durst, Duane A.; McArthur, James F.; and Johnson, Michael E., 4,388,644, Cl. 358-84.000.

Johnson, Richard P.: *See*—
Willbanks, Henry O.; and Johnson, Richard P., 4,388,518, Cl. 219-455.000.

Johnson, Robert B.: *See*—
Nibby, Chester M., Jr.; and Johnson, Robert B., 4,388,684, Cl. 364-200.000.

Johnson, Robert R.: *See*—
Reynolds, Martin L.; and Johnson, Robert R., 4,387,728, Cl. 131-336.000.

Johnston, Robert J.: *See*—
Twibell, Jerome J.; and Johnston, Robert J., 4,388,687, Cl. 364-200.000.

Jonas, Gerhard, to Bayer Aktiengesellschaft. Purifying thionyl chloride with $AlCl_3$ catalyst. 4,388,290, Cl. 423-468.000.

Jones, Darrell L. Wellhead system for exploratory wells. 4,387,771, Cl. 166-341.000.

Jones, Eric: *See*—
Hartshorn, Angus J.; Jones, Eric; and Segal, John A., 4,388,220, Cl. 252-429.00B.

Jones, James J.; and McIntosh, John O., to Texas Instruments Incorporated. Electronically controlled programmable digital thermostat having variable threshold hysteresis with time. 4,388,692, Cl. 364-557.000.

Jones, Jesse D.: *See*—
Hornbaker, Edwin D.; and Jones, Jesse D., 4,388,446, Cl. 525-175.000.

Jordan, Heinz, to Technische Gerate-u Entwicklungsgesellschaft m.b.H. Flying craft. 4,387,867, Cl. 244-12.200.
Jory, Howard R.: *See*—
Symons, Robert S.; and Jory, Howard R., 4,388,555, Cl. 315-4.000.
Josephson, Elliot, to Astec Components, Ltd. Electronic ballast circuit. 4,388,562, Cl. 315-205.000.
Joy Manufacturing Company: *See*—
Hoover, Merle L., deceased, 4,387,801, Cl. 198-821.000.
Jukkola, Glen D.: *See*—
Goodstine, Stephen L.; and Jukkola, Glen D., 4,387,667, Cl. 122-4.00D.
Jung, Ernst-Gunter: *See*—
Sander, Wolfgang; and Jung, Ernst-Gunter, 4,388,511, Cl. 219-10.55R.
Jung GmbH: *See*—
Sander, Wolfgang; and Jung, Ernst-Gunter, 4,388,511, Cl. 219-10.55R.
Jung, Michel: *See*—
Bey, Philippe; and Jung, Michel, 4,388,466, Cl. 548-337.000.
Junghans, Rudi: *See*—
Jeschke, Willi; Junghans, Rudi; Beisel, Hermann; and Hofmann, Gunther, 4,387,648, Cl. 101-365.000.
Jungwirth, Dieter: *See*—
Wlodkowski, Johann; and Jungwirth, Dieter, 4,388,014, Cl. 403-369.000.
Junkers, John K. Hydraulic wrench for simultaneously tightening or loosening at least two threaded connectors. 4,387,611, Cl. 81-57.360.
Kabe, Kazuyuki: *See*—
Kato, Masaki; Morikawa, Tuneo; and Kabe, Kazuyuki, 4,387,755, Cl. 152-209.00R.
Kabushiki Kaisha Daini Seikosha: *See*—
Ishizawa, Tadao, 4,387,936, Cl. 308-10.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Sudo, Masatoshi; Hashimoto, Shunichi; and Kambe, Shoji, 4,388,122, Cl. 148-12.00F.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Enomae, Satoru, 4,387,796, Cl. 198-374.000.
Kabushiki Kaisha Saginomiya Seisakusho: *See*—
Machida, Shigeki; and Makita, Takeo, 4,388,605, Cl. 337-301.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Mikoshiba, Hitoshi; Fujimori, Kazuyoshi; Onodera, Kenji; and Takeuchi, Shin, 4,387,643, Cl. 101-110.000.
Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Moriya, Shigeru; Yoshida, Akio; Tanaka, Koichi; and Nishimura, Yuji, 4,387,912, Cl. 280-804.000.
Yasumatsu, Jun; Tsuge, Hiroshi; and Kawaharazaki, Takashi, 4,387,790, Cl. 188-65.300.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Suzuki, Hajime; Umemura, Yoshifumi; and Kimbara, Masahiko, 4,387,743, Cl. 139-110.000.
Kadota, Michio: *See*—
Wakino, Kikuo; Kadota, Michio; and Sato, Tomoharu, 4,388,600, Cl. 333-151.000.
Kagan, Samuil I.: *See*—
Shipaev, Gennady A.; Seliverstov, Vyacheslav V.; Osipov, Nikolai A.; Prolygin, Anatoly P.; Mashikhin, Anatoly D.; Askinazi, Mikhail P.; Andreev, Jury M.; and Kagan, Samuil I., 4,388,569, Cl. 318-87.000.
Kahl, Manfred E. Self setting fish hook means. 4,387,528, Cl. 43-36.000.
Kaibel, Gerd: *See*—
Hochstein, Waldheim; Kaibel, Gerd; Mueller, Franz-Josef; and Hartmann, Horst, 4,388,154, Cl. 203-35.000.
Kaji, Kiyokane, to Toyota Jidosha Kogyo Kabushiki Kaisha. Knocking detector of an internal combustion engine. 4,387,588, Cl. 73-35.000.
Kajihara, Kunio, to Asahi Kasei Kogyo Kabushiki Kaisha. Artificial reef assembly construction. 4,388,019, Cl. 405-25.000.
Kajino, Jirou; Minabe, Hitoshi; and Murata, Shigeki, to Matsushita Electric Industrial Co., Ltd. Magnetic tape recording and/or reproducing apparatus. 4,388,658, Cl. 360-85.000.
Kale, B. Michael: *See*—
Doremus, Robert H.; Csanak, George; Kale, B. Michael; and Moore, James E., 4,388,413, Cl. 501-40.000.
Kalnin, Ilmar L., to Celanese Corporation. Intercalation of graphitic carbon fibers. 4,388,227, Cl. 252-510.000.
Kamada, Kensuke: *See*—
Ishida, Masamichi; Kamo, Jun; Takemura, Toru; Minami, Shunsuke; and Kamada, Kensuke, 4,388,256, Cl. 264-41.000.
Kambe, Shoji: *See*—
Sudo, Masatoshi; Hashimoto, Shunichi; and Kambe, Shoji, 4,388,122, Cl. 148-12.00F.
Kamiya, Fumio: *See*—
Yamazaki, Kyoji; and Kamiya, Fumio, 4,388,567, Cl. 315-291.000.
Kamiyama, Takashi: *See*—
Koshiishi, Kiyozo; Ono, Noriaki; Kamiyama, Takashi; and Kato, Yoshimi, 4,388,165, Cl. 204-418.000.
Ono, Noriaki; and Kamiyama, Takashi, 4,388,167, Cl. 204-420.000.
Kamo, Jun: *See*—
Ishida, Masamichi; Kamo, Jun; Takemura, Toru; Minami, Shunsuke; and Kamada, Kensuke, 4,388,256, Cl. 264-41.000.
Kampf, Eberhard, to Erwin Kampf GmbH & Co. Machine for separating double-rolled aluminum sheet. 4,387,861, Cl. 242-75.470.
Kanai, Wataru, to Tokyo Ohka Kogyo Kabushiki Kaisha. Photosensitive composition for dry development. 4,388,397, Cl. 430-197.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Oizumi, Masayuki; Abe, Masaharu; and Fushiki, Yasuo, 4,388,129, Cl. 156-73.100.
Kaneko, Tadahiro: *See*—
Sato, Koji; and Kaneko, Tadahiro, 4,388,676, Cl. 362-260.000.
Kaneshige, Ryosuke: *See*—
Nagano, Riichiro; and Kaneshige, Ryosuke, 4,388,202, Cl. 252-52.00A.
Kansai Paint Co., Ltd.: *See*—
Sugiura, Shinji; and Horibe, Kyoichi, 4,388,445, Cl. 525-124.000.
Kanuma, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Substrate bias generation circuit. 4,388,537, Cl. 307-297.000.
Kanzaka, Yoshihiro, to Yoshida Kogyo K.K. Fabric-covered button. 4,387,488, Cl. 24-113.00R.
Kaplan, Robert A.; and Wellman, James E., to Scott & Fetzer Company, The. Energy efficient high static pressure fluid fuel burner. 4,388,064, Cl. 431-265.000.
Kapur, Vijay K.; and Khanna, Ashok K., to Atlantic Richfield Company. Process for recovery of high purity silicon. 4,388,080, Cl. 23-293.00R.
Kapur, Vijay K.; and Choudary, Uppala V., to Atlantic Richfield Company. Silicon purification. 4,388,286, Cl. 423-348.000.
Karam, Ronald E.: *See*—
Faria, Sixdeniel; and Karam, Ronald E., 4,388,394, Cl. 430-94.000.
Karavanov, Andrei N.: *See*—
Gryaznov, Vladimir M.; Karavanov, Andrei N.; Belosljudova, Tamara M.; Ermolaev, Anatoly V.; Maganjuk, Anatoly P.; and Sarycheva, Irina K., 4,388,479, Cl. 568-828.000.
Karly Mayer Textilmaschinenfabrik GmbH: *See*—
Branke, Walter; and Winter, Karl, 4,387,579, Cl. 66-157.000.
Karpati, Egon: *See*—
Nyeki, Olga; Kisfaludy, Lajos; Karpati, Egon; and Szporny, Laszlo, 4,388,304, Cl. 424-177.000.
Kashio, Toshio, to Casio Computer Co., Ltd. System for generating sample tones on an electronic musical instrument. 4,387,619, Cl. 84-1.030.
Kaschau, Kenneth. Propeller exhaust hub and shroud. 4,388,070, Cl. 440-89.000.
Kasuga, Muneo: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,387,986, Cl. 355-75.000.
Katagiri, Masayoshi; and Ogura, Osamu, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Brake booster. 4,387,625, Cl. 91-369.00B.
Kato, Hirokazu; and Endo, Akinori, to Nippon Gakki Seizo Kabushiki Kaisha. Assigner for electronic musical instrument. 4,387,617, Cl. 84-1.010.
Kato, Hisaaki: *See*—
Nakahara, Teiji; Morihashi, Toshifumi; Nakayama, Teruo; Nishimura, Shinichi; Kato, Hisaaki; Uematsu, Ikuzo; and Yoshioka, Takashi, 4,387,487, Cl. 19-249.000.
Kato, Kaneyoshi: *See*—
Terao, Shinji; Shiraishi, Mitsuru; and Kato, Kaneyoshi, 4,388,312, Cl. 424-244.000.
Kato, Kaoru: *See*—
Takemura, Yozo; Kobayashi, Isao; Akita, Yasuhiro; and Kato, Kaoru, 4,388,113, Cl. 75-51.000.
Kato, Masaaki: *See*—
Ueyanagi, Kaoru; Ide, Akira; Kato, Masaaki; and Komatsu, Kazuro, 4,388,245, Cl. 260-453.0AB.
Kato, Masaie: *See*—
Hamane, Masumi; Shigihara, Akira; and Kato, Masaie, 4,387,606, Cl. 74-752.00E.
Kato, Masaki; Morikawa, Tuneo; and Kabe, Kazuyuki, to Yokohama Rubber Co., Ltd., The. Pneumatic tires. 4,387,755, Cl. 152-209.00R.
Kato, Yoshiaki; and Fushida, Akira, to Mita Industrial Co., Ltd. Laminated photosensitive plate for electrophotography having an electron donative polymer and phenanthrene charge transport layer. 4,388,392, Cl. 430-58.000.
Kato, Yoshimi: *See*—
Koshiishi, Kiyozo; Ono, Noriaki; Kamiyama, Takashi; and Kato, Yoshimi, 4,388,165, Cl. 204-418.000.
Katsube, Junki: *See*—
Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, 4,388,469, Cl. 549-59.000.
Katsumata, Masaaki; and Yoneda, Kenji, to Nissan Motor Company, Limited. Knock control system and method for turbosupercharger installed engines. 4,387,571, Cl. 60-602.000.
Katz, David H., to Scripps Clinic & Research Foundation. Induction of immunological tolerance. 4,388,441, Cl. 525-54.100.
Kaufman, Edward R.; Benson, Gregory R.; and Shaines, Alfred, to Glennco Trust. Friction lining material. 4,388,423, Cl. 523-153.000.
Kavli, Fred: *See*—
Bell, Robert L.; Willing, Robert; and Kavli, Fred, 4,388,668, Cl. 361-283.000.
Kawaguchi, Takeyuki; Minematsu, Hiroyoshi; Hayashi, Yuzuru; and Hara, Shigeyoshi. Process for preparation of improved semipermeable composite membranes. 4,388,189, Cl. 210-490.000.
Kawaharazaki, Takashi: *See*—
Yasumatsu, Jun; Tsuge, Hiroshi; and Kawaharazaki, Takashi, 4,387,790, Cl. 188-65.300.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,387,622, Cl. 84-1.220.
Kawakami, Hajime: *See*—
Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, 4,388,469, Cl. 549-59.000.

Kawamata, Motoo: *See—*
Kudoh, Akihide; Kawamata, Motoo; Ohshima, Kazushi; Kotani, Makoto; Tsuda, Takeshi; and Aoki, Fukuichi, 4,388,478, Cl. 568-804.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Fujikawa, Tetsuzo, 4,387,780, Cl. 180-54.00A.

Kawasugi, Tadaaki: *See—*
Fujimoto, Tadao; and Kawasugi, Tadaaki, 4,388,186, Cl. 210-170.000.

Kayamoto, Masami: *See—*
Wilson, Geoffrey; and Kayamoto, Masami, 4,388,222, Cl. 252-437.000.

Kaylico Corporation: *See—*
Bell, Robert L.; Willing, Robert; and Kavli, Fred, 4,388,668, Cl. 361-283.000.

Kearns, Kenneth L. Respiration monitor and x-ray triggering apparatus. 4,387,722, Cl. 128-716.000.

Keen, James, to United States of America, Army. Control device for steerable null antenna processor. 4,388,723, Cl. 375-1.000.

Keene Corporation: *See—*
Meyer, E. Robert, 4,388,681, Cl. 362-374.000.

Keep, Henry, Jr.; Santagata, Daniel A.; Harris, Matthew E.; and Welsh, William H., Jr., to Multistress, Inc. Electrical heating cable connector. 4,388,523, Cl. 219-541.000.

Keizer, Eugene O., to RCA Corporation. Technique for uniform stylus configuration. 4,388,714, Cl. 369-173.000.

Keller, Alex J.; Williams, Joseph R.; Fechner, Erhard A.; and Pinto, Akiva, to Automatic Material Handling, Inc. Control system for fiber processing apparatus. 4,387,486, Cl. 19-105.000.

Kellogg, Robert M.; and Mulzet, Alfred P., to International Business Machines Corporation. Centrifuge assembly. 4,387,848, Cl. 494-81.000.

Kelly, John W., to Haskel Engineering & Supply Co. Method and apparatus for radially expanding tubes. 4,387,507, Cl. 29-727.000.

Kelsey-Hayes Company: *See—*
Rozmus, Walter J., Jr.; and Rozmus, Walter J., 4,388,088, Cl. 55-101.000.

Kennecott Corporation: *See—*
Jewell, Walter E. B.; and Patarcity, Adam J., 4,388,259, Cl. 264-153.000.

Kennedy, William L.; and Fanson, Richard L., to Whirlpool Corporation. Automatic washer energy absorbing spin delay mechanism. 4,387,580, Cl. 68-12.00R.

Kennell, Samuel C.; and Witkiewicz, Ronald F., to SCM Corporation. Caulk containing microballoons. 4,388,424, Cl. 523-219.000.

Kern, John T. Panel assembly and a method of constructing said assembly. 4,387,545, Cl. 52-455.000.

Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung: *See—*
Lubecki, Andrzej; Wiese, Kurt; and Winkler, Karl, 4,388,530, Cl. 378-45.000.

Khan, Aman U.: *See—*
Necas, Donald E.; and Khan, Aman U., 4,387,860, Cl. 241-282.100.

Khanna, Ashok K.: *See—*
Kapur, Vijay K.; and Khanna, Ashok K., 4,388,080, Cl. 23-293.00R.

Khosropour, Mostafa M., to Nelson Industries, Inc. Air cleaner having a dust dumping valve. 4,388,091, Cl. 55-337.000.

Kibby, Robert M., to Reynolds Metals Company. Minimum-energy process for carbothermic reduction of alumina. 4,388,107, Cl. 75-10.00R.

Kigyos, Frank, to Block Drug Company, Inc. Interproximal toothbrush. 4,387,479, Cl. 15-167.00R.

Kihara, Hisatsugu: *See—*
Takao, Kengo; Ohmachi, Mineo; Kihara, Hisatsugu; Toki, Kenshiro; Tomita, Yukio; and Mizota, Toshihiro, 4,387,562, Cl. 60-39.150.

Kikuchi, Yoshiki: *See—*
Moriguchi, Haruhiko; Kikuchi, Yoshiki; and Ohmori, Takashi, 4,388,628, Cl. 346-76.0PH.

Kimbara, Masahiko: *See—*
Suzuki, Hajime; Umemura, Yoshifumi; and Kimbara, Masahiko, 4,387,743, Cl. 139-110.000.

Kimble, Thomas E., to Baldwin Piano & Organ Company. Parallel motion linkage for the sliding keyboard cover of a piano. 4,387,623, Cl. 84-179.000.

Kimmell, Steven D.: *See—*
Murphy, Jack P., deceased; and Kimmell, Steven D., 4,387,702, Cl. 126-424.000.

Kimmerle, Frank M.; and Roberge, Pierre, to Societe Nationale de L'Amiante. Titanium coated asbestos fiber. 4,388,149, Cl. 162-153.000.

Kimura, Kazuo: *See—*
Yamazaki, Yasuo; Kimura, Kazuo; and Tanimoto, Tetuyuki, 4,387,967, Cl. 350-423.000.

Kimura, Takao; and Yamanishi, Toru, to Nippon Telegraph & Telephone Public Corporation; and Sumitomo Electric Industries, Ltd. Process for producing a glass fiber for light transmission. 4,388,093, Cl. 65-3.110.

Kimura, Tomoaki: *See—*
Awazuhara, Hiroshi; Tsumura, Sukebumi; and Kimura, Tomoaki, 4,387,586, Cl. 72-206.000.

King, Bruce D.; and Levin, James P., to International Business Machines Corporation. Mask set mismatch. 4,388,386, Cl. 430-5.000.

King, Dennis D. Receiver with squelch for offset carrier environment. 4,388,731, Cl. 455-221.000.

King, John A., to Harman International Industries. Loudspeaker having acoustic impedance frontal loading element. 4,387,787, Cl. 181-155.000.

Kinoshita, Koichi: *See—*
Hosono, Nagao; Kinoshita, Koichi; and Takahashi, Toru, 4,387,664, Cl. 118-658.000.
Ueno, Tsuyoshi; Mukai, Hideo; Nakatomi, Yoshitsugu; Saito, Hiroshi; Kinoshita, Koichi; and Konuma, Takaaki, 4,387,980, Cl. 355-3.0CH.

Kisfaludy, Lajos: *See—*
Nyeki, Olga; Kisfaludy, Lajos; Karpati, Egon; and Szporny, Laszlo, 4,388,304, Cl. 424-177.000.

Kishida, Kazuo; Sasaki, Isao; Kushi, Kenji; and Tamura, Misao, to Mitsubishi Rayon Company Ltd. Coating composition and process for preparing synthetic resin shaped articles by using same. 4,388,345, Cl. 427-54.100.

Kispert, Klaus: *See—*
Walter, Lothar; Olschewski, Armin; Kispert, Klaus; and Meining, Hans, 4,387,939, Cl. 308-217.000.

Kita, Yuzo: *See—*
Takagi, Katsuaki; and Kita, Yuzo, 4,388,612, Cl. 340-347.0DA.

Kitada, Masashi: *See—*
Ishida, Hideo; Kitada, Masashi; and Ihara, Keisaku, 4,388,215, Cl. 252-402.000.

Kitahiro, Isamu: *See—*
Ogawa, Kazufumi; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, 4,388,128, Cl. 156-64.000.

Kitajima, Masao: *See—*
Yazawa, Kenichiro; Kitajima, Masao; and Kondo, Asaji, 4,387,990, Cl. 356-244.000.

Kitamura, Yoichi; Kobayashi, Seishichi; and Ueno, Hiroshi, to Toyo Seikan Kaisha, Ltd. Side seam-coated tinplate welded can. 4,387,830, Cl. 220-456.000.

Kitano, Yuichi: *See—*
Tada, Yoshiharu; and Kitano, Yuichi, 4,388,571, Cl. 318-293.000.

Kitano, Yuji: *See—*
Saito, Seiichi; and Kitano, Yuji, 4,388,725, Cl. 375-36.000.

Kitoh, Shinya: *See—*
Suzuki, Shin-ichi; Kitoh, Shinya; Toda, Haruhiko; and Higo, Moriaki, 4,388,421, Cl. 523-118.000.

Klebe, Hans: *See—*
Fratzer, Gerhard; Beck, Bernhard; Dold, Erwin; and Klebe, Hans, 4,388,275, Cl. 422-180.000.

Klein, Imrich: *See—*
Klein, Reuben; and Klein, Imrich, 4,387,997, Cl. 366-79.000.

Klein, Reuben; and Klein, Imrich, to Scientific Process & Research, Inc. Plasticating extruder screw conveyors. 4,387,997, Cl. 366-79.000.

Klein, Robert W., to William H. Rorer, Inc. Method and composition for treating acne. 4,388,301, Cl. 424-154.000.

Klein, Steven H.; and Smith, Alfred H., Jr., to General Electric Company. Shelf-stable catalyst component for RTV silicone composition. 4,388,433, Cl. 524-401.000.

Kleiner, Hans-Jerg: *See—*
Dursch, Walter; and Kleiner, Hans-Jerg, 4,388,252, Cl. 260-968.000.

Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., to International Flavors & Fragrances Inc. Process of augmenting the aroma of detergents using methyl substituted norbornane carboxaldehyde dimethyl acetals or norbornene carbonitriles. 4,388,207, Cl. 252-174.110.

Klenk, Emil, to Maschinenbau Oppenweiler Binder GmbH & Co. Device for pivoting the knife in its longitudinal axis and for adjusting the knife depth on knife folding machines. 4,388,073, Cl. 493-444.000.

Kline, Charles M.: *See—*
Young, Terry A.; Mann, William W.; Kline, Charles M.; and Schoeneberger, Ernest A., 4,387,857, Cl. 241-101.00B.

Klingenberg, Wolfgang: *See—*
Wehking, Hans; Eichler, Detlef; and Klingenberg, Wolfgang, 4,388,005, Cl. 400-144.200.

Klingenmaier, Otto J., to General Motors Corporation. Electrodeposition of low stress, hard iron alloy and article so produced. 4,388,379, Cl. 428-613.000.

Klipsch and Associates, Inc.: *See—*
Klipsch, Paul W.; and Hunter, James R., 4,387,786, Cl. 181-150.000.

Klipsch, Paul W.; and Hunter, James R., to Klipsch and Associates, Inc. Anechoic chamber arrangement. 4,387,786, Cl. 181-150.000.

Klockner-Humboldt-Deutz AG: *See—*
Guttmann, Friedrich W.; and Weigel, Horst, 4,388,082, Cl. 48-76.000.

Klockner-Humboldt Deutz Aktiengesellschaft: *See—*
Tholen, Paul, 4,387,678, Cl. 123-193.00H.
Weber, Thomas, 4,388,042, Cl. 416-198.00A.

Knackstedt, Hans-Gunther; Muller, Erhard; Christ, Richard; and Kroll, Hartmut, to Transnuklear GmbH. Transportation and/or storage containers for radioactive materials. 4,388,268, Cl. 376-272.000.

Knapp, Heinrich: *See—*
Hoppel, Rainer; and Knapp, Heinrich, 4,387,695, Cl. 123-585.000.

Kneissl, Hannes: *See—*
Schmid, Klaus; and Kneissl, Hannes, 4,388,170, Cl. 208-8.0LE.

Knochel, E. Stanley. Walker. 4,387,891, Cl. 272-70.300.

Knypl, Eugeniusz: *See—*
Knypl, Maria; Knypl, Eugeniusz; Starzak, Marian; Mieczkowska, Ewa; Pawlus, Urszula; Palubicki, Romuald; Ficek, Mieczyslaw; and Goldynia, Jozef, 4,388,438, Cl. 524-833.000.

Knypl, Maria; Knypl, Eugeniusz; Starzak, Marian; Mieczkowska, Ewa; Pawlus, Urszula; Palubicki, Romuald; Ficek, Mieczyslaw; and Gol-

dynia, Jozef, to Osrodek Badaw Cze-Rozwojowy Kauczukow I Tworzyw Winylowych. Aqueous dispersions of copolymers of styrene dibutyl maleate and acrylic or methacrylic acid or monobutyl maleate and method for preparation thereof. 4,388,438, Cl. 524-833.000.

Ko, Young C.: *See*—
Allan, George G.; and Ko, Young C., 4,388,352, Cl. 427-391.000.

Kobayashi, Hisao: *See*—
Koshimura, Yasunobu; Kobayashi, Hisao; and Aoike, Nanjou, 4,388,561, Cl. 315-171.000.

Kobayashi, Isao: *See*—
Takemura, Yozo; Kobayashi, Isao; Akita, Yasuhiro; and Kato, Kaoru, 4,388,113, Cl. 75-51.000.

Kobayashi, Seishichi: *See*—
Kitamura, Yoichi; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,387,830, Cl. 220-456.000.

Koch, Karl: *See*—
Bartel, Gunter; Patz, Eckhard; Koch, Karl; Stern, Georg; Stotz, Manfred; and Triffterer, Adolf, 4,388,053, Cl. 417-542.000.

Kochey, Edward L., Jr., to Combustion Engineering, Inc. Tube arrangement for furnace wall. 4,387,668, Cl. 122-6.00A.

Kodaira, Masao: *See*—
Nakazato, Yasuaki; Miyazaki, Yasushi; Osuga, Makoto; and Kodaira, Masao, 4,388,140, Cl. 156-345.000.

Kodama, Hisashi: *See*—
Hori, Takanobu; Arai, Fuminao; Kodama, Hisashi; and Okabe, Yoshio, 4,387,675, Cl. 123-90.580.

Koezuka, Junji: *See*—
Suzuki, Shuichi; Aizawa, Masuo; Koyama, Masao; Sato, Yuichi; and Koezuka, Junji, 4,388,166, Cl. 204-403.000.

Kohne, Theodore J.: *See*—
Brown, Charles R.; Kohne, Theodore J.; and Lancto, Donald C., 4,387,639, Cl. 101-2.000.

Koike, Norio; Sasano, Akira; Taniguchi, Yoshio; Nakano, Toshio; Aoki, Masakazu; and Takemoto, Iwao, to Hitachi, Ltd. Method of producing solid-state color imaging devices. 4,387,987, Cl. 355-133.000.

Koive Sawchain Company: *See*—
Lemery, Douglas J., 4,387,615, Cl. 83-56.000.

Komatsu, Kazuro: *See*—
Ueyanagi, Kaoru; Ide, Akira; Kato, Masaaki; and Komatsu, Kazuro, 4,388,245, Cl. 260-453.0AB.

Komatsu, Shigeru; Hirahata, Shigeru; and Tachiuchi, Tsuguji, to Hitachi, Ltd. Drive circuit for character and graphic display device. 4,388,621, Cl. 340-802.000.

Komatsu, Shigeru; Mizukami, Kazushi; Tachiuchi, Tsuguji; Nagai, Kunihiko; and Koyama, Takuo, to Hitachi, Ltd. Memory selecting system. 4,388,707, Cl. 365-230.000.

Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH: *See*—
Eckle, Otto; and Winger, Paul, 4,387,612, Cl. 82-2.00E.

Kondo, Asaji: *See*—
Yazawa, Kenichiro; Kitajima, Masao; and Kondo, Asaji, 4,387,990, Cl. 356-244.000.

Kondo, Shigeru: *See*—
Ogawa, Kazufumi; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, 4,388,128, Cl. 156-64.000.

Konig-Electronic Friedrich W. Konig: *See*—
Becella, Peter, 4,388,663, Cl. 360-128.000.

Konig, Klaus: *See*—
Heitkamper, Peter; Konig, Klaus; Fauss, Rudolf; and Findeisen, Kurt, 4,388,238, Cl. 260-239.00E.
Sundermann, Rudolf; Konig, Klaus; Engbert, Theodor; Becker, Gernot; and Hammen, Gunther, 4,388,246, Cl. 260-453.00P.

Konstantouros, Efthimios; and Hoeck, Karl, to Siemens Aktiengesellschaft. Device for regenerating hydrochloric copper chloride etching solutions. 4,388,276, Cl. 422-187.000.

Konuma, Takaaki: *See*—
Ueno, Tsuyoshi; Mukai, Hideo; Nakatomi, Yoshitsugu; Saito, Hiroshi; Kinoshita, Koichi; and Konuma, Takaaki, 4,387,980, Cl. 355-3.0CH.

Koppanen, Jorma T.: *See*—
Saarisalo, Risto A.; and Koppanen, Jorma T., 4,387,880, Cl. 251-285.000.

Kornbau, Thomas W.; and Sievers, Robert A., to General Dynamics Electronics Division. Method of forming metallic patterns on curved surfaces. 4,388,388, Cl. 430-258.000.

Korpman, Ralf; and Felice, C. Palermo, to Permacel. Extrusion coating process. 4,388,349, Cl. 427-208.400.

Kortick, Morris, to A & H Mfg. Co. Label printing apparatus. 4,387,641, Cl. 101-27.000.

Koshiishi, Kiyozo; Ono, Noriaki; Kamiyama, Takashi; and Kato, Yoshimi, to Olympus Optical Company Ltd. Selective ion sensitive electrode and method of making it. 4,388,165, Cl. 204-418.000.

Koshimura, Yasunobu; Kobayashi, Hisao; and Aoike, Nanjou, to Toshiba Electric Equipment Corporation. Apparatus for operating discharge lamps. 4,388,561, Cl. 315-171.000.

Kotani, Makoto: *See*—
Kudoh, Akihide; Kawamata, Motoo; Ohshima, Kazushi; Kotani, Makoto; Tsuda, Takeshi; and Aoki, Fukuichi, 4,388,478, Cl. 568-804.000.

Kotecha, Harish N.: *See*—
Bertin, Claude L.; Kotecha, Harish N.; and Wiedman, Francis W., 4,388,704, Cl. 365-154.000.

Kotok, Alan; Murphy, Daniel L.; and Stewart, Robert E., to Digital Equipment Corporation. Central processor with apparatus for extended virtual addressing. 4,388,685, Cl. 364-200.000.

Kottgen, Eckart U.: *See*—
Fabricius, Hans-Ake; and Kottgen, Eckart U., 4,388,309, Cl. 424-180.000.

Kouchi, Toshihiro: *See*—
Nishibayashi, Hatsumi; Amagai, Yoshimi; Hikake, Norio; Kouchi, Toshihiro; and Aizawa, Tatsuo, 4,388,396, Cl. 430-126.000.

Kovalev, German V.: *See*—
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.

Kovalev, Viktor M.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.

Kovar, Wayne A.: *See*—
Bishop, Thomas R.; Chancey, Roger D.; and Kovar, Wayne A., 4,387,885, Cl. 267-125.000.

Koyama, Masao: *See*—
Suzuki, Shuichi; Aizawa, Masuo; Koyama, Masao; Sato, Yuichi; and Koezuka, Junji, 4,388,166, Cl. 204-403.000.

Koyama, Minoru: *See*—
Takezoe, Fumihiko; and Koyama, Minoru, 4,388,716, Cl. 370-29.000.

Koyama, Shigeo; Yamagata, Ryutaro; Kozuka, Nobuhiko; and Sakata, Hiromi, to Mita Industrial Co., Ltd. Copying apparatus provided with a cassette-type paper feeding mechanism. 4,387,889, Cl. 271-10.000.

Koyama, Shozo; Manning, John W., Jr.; Ammons, William S.; and Santiesteban, Hector L., to Boehringer Ingelheim International GmbH. Method of treating endotoxin shock with a pyrimido-pyrimidine derivative. 4,388,318, Cl. 424-251.000.

Koyama, Takuo: *See*—
Komatsu, Shigeru; Mizukami, Kazushi; Tachiuchi, Tsuguji; Nagai, Kunihiko; and Koyama, Takuo, 4,388,707, Cl. 365-230.000.

Koyanagi, Yukiaki: *See*—
Kumagai, Ikuo; Koyanagi, Yukiaki; and Hidaka, Hiroshi, 4,388,009, Cl. 400-679.000.

Kozuka, Nobuhiko: *See*—
Koyama, Shigeo; Yamagata, Ryutaro; Kozuka, Nobuhiko; and Sakata, Hiromi, 4,387,889, Cl. 271-10.000.

Kraemer, Dieter; Lehmann, Klaus; and Hartl, Roland, to Rohm GmbH. Rapid diagnostic agents. 4,388,271, Cl. 422-56.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Becker, Bernard; Meyer-Pittroff, Roland; and Frohlich, Gunter, 4,387,574, Cl. 60-641.110.
Schwanzer, Wilhelm, 4,388,546, Cl. 310-196.000.

Kramer, Petrus A.; and Verbrugge, Pieter A., to Shell Oil Company. Trihalomethylation of aldehydes. 4,388,247, Cl. 260-463.000.

Kranz, Eckart: *See*—
Elbe, Hans-Ludwig; Arold, Hermann; Kranz, Eckart; and Stolzer, Claus, 4,388,465, Cl. 548-262.000.

Kranz, Max L., to U.S.D. Corp. Fiberoptic pressure gauge. 4,387,600, Cl. 73-714.000.

Kreiskott, Horst: *See*—
Steiner, Gerd; Franke, Albrecht; Lenke, Dieter; Teschendorf, Hans-Juegen; Worstmann, Wolfgang; and Kreiskott, Horst, 4,388,237, Cl. 260-239.0BC.

Kreuzer, Franz-Heinrich: *See*—
Finkelmann, Heino; Rehage, Gunther; and Kreuzer, Franz-Heinrich, 4,388,453, Cl. 528-15.000.

Kristinsson, Haukur; Muller, Beat; and Pachlatko, Johannes P., to Ciba-Geigy Corporation. Thiadiazolyl-glyoxylonitrile-2-oxime ether derivatives for protecting plant crops. 4,388,464, Cl. 548-136.000.

Kristoffersson, Ingmar, to Alfa-Laval AB. Arrangement for locating the plates included in a plate heat exchanger. 4,387,765, Cl. 165-166.000.

Krivosheina, Larisa I.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.

Kroger, Tapani; and Luostarinen, Raimo. Trotter exercising cart. 4,387,908, Cl. 280-63.000.

Kroll, Hartmut: *See*—
Knackstedt, Hans-Gunther; Muller, Erhard; Christ, Richard; and Kroll, Hartmut, 4,388,268, Cl. 376-272.000.

Krueger, William R., to Outboard Marine Corporation. Battery charger with transducer for controlling charge rate. 4,388,583, Cl. 320-46.000.

Krupp-Koppers GmbH: *See*—
Kuppenbender, Rainer, 4,388,151, Cl. 201-2.000.

Kubo, Tateo, to Toyo Seikan Kaisha, Ltd. Molding device for forming a liner inside of a closure shell. 4,388,058, Cl. 425-110.000.

Kubota Ltd.: *See*—
Fujimoto, Tadao; and Kawasugi, Tadaaki, 4,388,186, Cl. 210-170.000.

Kubota, Yuichi, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,388,376, Cl. 428-425.900.

Kucera, Carrell J., to Norden Laboratories, Inc. Modified pasteurella bacteria and vaccines prepared therefrom. 4,388,299, Cl. 424-92.000.

Kudoh, Akihide; Kawamata, Motoo; Ohshima, Kazushi; Kotani, Makoto; Tsuda, Takeshi; and Aoki, Fukuichi, to Mitsui Toatsu Chemicals, Inc. Process for the ortho-alkylation of phenolic compounds. 4,388,478, Cl. 568-804.000.

Kudoh, Michio: *See*—
Imai, Hirosuke; Matsuno, Mitsuo; and Kudoh, Michio, 4,388,480, Cl. 585-516.000.

Kumagai, Ikuo; Koyanagi, Yukiaki; and Hidaka, Hiroshi, to Nippon Electric Company, Limited. Cooling system for a line printer. 4,388,009, Cl. 400-679.000.

Kunda, Wasyl, to Sherritt Gordon Mines Limited. Process for the production of silver powder from silver chloride, sulphate or sulphide. 4,388,109, Cl. 75-0.50B.

Kuno, Akira; Matsumoto, Muneaki; and Numata, Koji, to Nippon Soken, Inc. Demagnetizer for use in vehicles. 4,388,666, Cl. 361-149.000.

Kunz, Volker G.: *See*—
Acimovic, Simeon; Lindemann, Karl-Heinz; and Kunz, Volker G., 4,388,161, Cl. 204-43.00S.

Kunze, Dieter: *See*—
Wicek, Rudolf; and Kunze, Dieter, 4,388,488, Cl. 174-92.000.

Kuo, George Y.: *See*—
Dewey, Richard H.; Hwang, Bruce Y.; and Kuo, George Y., 4,388,240, Cl. 260-239.0BB.

Kuppenbender, Rainer, to Krupp-Koppers GmbH. Method and device for feeding purging and degraphitizing air into coke ovens. 4,388,151, Cl. 201-2.000.

Kuramoto, Shinichi: *See*—
Tsubuko, Kazuo; Hashimoto, Junichiro; Kuramoto, Shinichi; and Okawara, Makoto, 4,388,395, Cl. 430-114.000.

Kurita, Yukio; and Nakagawa, Satoshi, to Matsushita Electric Works, Ltd. Structural column and method of manufacture. 4,387,546, Cl. 52-731.000.

Kuroda, Hitoshi: *See*—
Inui, Tsuneo; Kuroda, Hitoshi; Hanabusa, Tetsuro; and Yazaki, Katsuhito, 4,388,158, Cl. 204-27.000.

Kuroyanagi, Makoto: *See*—
Iwamoto, Kenji; and Kuroyanagi, Makoto, 4,387,570, Cl. 60-600.000.

Kushi, Kenji: *See*—
Kishida, Kazuo; Sasaki, Isao; Kushi, Kenji; and Tamura, Misao, 4,388,345, Cl. 427-54.100.

Kuwabara, Shohei: *See*—
Suzuki, Kazuaki; and Kuwabara, Shohei, 4,388,079, Cl. 8-648.000.

Kuzma, Petr; and Odorisio, Giovanina, to National Patent Development Corporation. Biologically stabilized compositions comprising collagen as the major component with ethylenically unsaturated compounds used as contact lenses. 4,388,428, Cl. 523-106.000.

Kyushu Hitachi Maxell, Ltd.: *See*—
Sano, Tadao, 4,388,674, Cl. 362-186.000.

L & A, Inc.: *See*—
Laux, Joseph J., 4,387,516, Cl. 36-43.000.

Labofina, S.A.: *See*—
Lepain, Andre; Bronchart, Robert; and Remacle, Roger, 4,388,407, Cl. 436-3.000.

Ladney, Michael, Jr.: *See*—
Hatfield, Raymond W., 4,388,353, Cl. 427-422.000.

Laesch, Daniel A. Golf bag carrier. 4,387,836, Cl. 224-32.00A.

La Fever, Clifford E., to United States of America, Army. Gun safety. 4,387,527, Cl. 42-70.00R.

Lake, Edwin D.: *See*—
Grey, James S.; Stuart, R. Daniel; and Lake, Edwin D., 4,387,605, Cl. 74-694.000.

Lamoth, Mihaly, to Motorola, Inc. Fixed frequency voltage regulator. 4,388,586, Cl. 323-283.000.

Lamoth, Mihaly; and Lehning, Heinz, to Motorola, Inc. Fixed frequency voltage regulator. 4,388,587, Cl. 323-283.000.

Lamparter, Helmut: *See*—
Schone, Peter; Olmann, Jurgen; and Lamparter, Helmut, 4,388,494, Cl. 179-1.00G.

Lampe, Seigfried, to E.C.H. Will (GmbH & Co.). Apparatus for changing the orientation of stacked paper sheets or the like. 4,387,890, Cl. 271-225.000.

Lampson, George P.: *See*—
Field, A. Kirk; Tytell, Alfred A.; and Lampson, George P., 4,388,306, Cl. 424-177.000.

Lancaster, Patrick R.; and Lancaster, William G., to Lantech, Inc. Power assisted roller-stretch wrapping process. 4,387,548, Cl. 53-399.000.

Lancaster, Patrick R.; and Lancaster, William G., to Lantech, Inc. Wrapping apparatus. 4,387,552, Cl. 53-556.000.

Lancaster, William G.: *See*—
Lancaster, Patrick R.; and Lancaster, William G., 4,387,548, Cl. 53-399.000.
Lancaster, Patrick R.; and Lancaster, William G., 4,387,552, Cl. 53-556.000.

Lancto, Donald C.: *See*—
Brown, Charles R.; Kohne, Theodore J.; and Lancto, Donald C., 4,387,639, Cl. 101-2.000.

Lange, Gerhard: *See*—
Zeidler, Guenter; Lange, Gerhard; and Saller, Helmut, 4,387,958, Cl. 350-96.230.
Zeidler, Guenter; Ney, Ernst; Lange, Gerhard; and Saller, Helmut, 4,388,485, Cl. 174-23.00C.

Lange, Howard G.; and Schulman, Ronald, to Zenith Radio Corporation. Rear projection screen. 4,387,959, Cl. 350-128.000.

Lanius, Charles A., to Flambeau Corporation. Arrowhead case and arrowhead wrench. 4,387,805, Cl. 206-230.000.

Lannan, Patrick E., to AMP Incorporated. Self-sealing test probe. 4,388,591, Cl. 324-158.00P.

Lantech, Inc.: *See*—
Lancaster, Patrick R.; and Lancaster, William G., 4,387,548, Cl. 53-399.000.
Lancaster, Patrick R.; and Lancaster, William G., 4,387,552, Cl. 53-556.000.

Lao, Binneg Y., to Bendix Corporation, The. Pressure compensated circuit for ion mass airflow sensors. 4,387,602, Cl. 73-861.090.

Lardon, Marcel: *See*—
Moll, Eberhard; and Lardon, Marcel, 4,388,164, Cl. 204-192.0SP.

Larrabee, Edward M. Extracting handle for earth drill augers. 4,387,483, Cl. 16-114.00R.

Larson, Jeffrey G., to Babcock & Wilcox Company, The. Spacer grid corner gusset. 4,388,269, Cl. 376-442.000.

Larson, Larry A., to Caterpillar Tractor Co. Test stand. 4,387,589, Cl. 73-119.00A.

Larsson, Hans-Gunnar, to ASEA Aktiebolag. Method for manufacturing elongated bodies by extrusion of powder in a capsule. 4,388,054, Cl. 419-32.000.

Larsson, Hans M.: *See*—
Sunden, Olof; Batelson, Per G.; Johansson, Hans E.; Larsson, Hans M.; and Svending, Per J., 4,388,150, Cl. 162-175.000.

Latimer, John P., to Deepsea Ventures, Inc. Separable liquid flow screening means for excluding oversized, slender objects carried by a liquid, and dredge means including same. 4,387,518, Cl. 37-57.000.

Lauriello, Alfred F.; and Swendrowski, Steven D., to Mostek Corporation. Multipin coupler. 4,387,946, Cl. 339-66.00M.

Laux, Joseph J., to L & A, Inc. Universal insole. 4,387,516, Cl. 36-43.000.

Lavrov, Vladimir V.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.

Lawson, Daniel D.: *See*—
United States of America, National Aeronautics and Space Administration; Corcoran, William H.; Fong, William S.; Pichaichanarong, Puvin; Chan, Paul C. F.; and Lawson, Daniel D., 4,388,171, Cl. 208-8.0LE.

Lebetzki, Egon: *See*—
Schneider, Hartmut; and Lebetzki, Egon, 4,388,095, Cl. 65-18.200.

Leblanc, Jean; Pigeroulet, Jean; Straubel, Max; and Eckert, Konrad, to Robert Bosch GmbH. Fuel injection apparatus for internal combustion engines, in particular for diesel engines. 4,387,686, Cl. 123-446.000.

Lechner, Uwe: *See*—
Wetzel, Bernd; Woitun, Eberhard; Maier, Roland; Reuter, Wolfgang; Lechner, Uwe; and Goeth, Hanns, 4,388,315, Cl. 424-246.000.

Lectron Products, Inc.: *See*—
Slavin, Michael; and Rea, Irvin B., 4,387,788, Cl. 181-171.000.

Lee, Franky B.; and Jobes, Orin, Jr., to Procter & Gamble Company, The. Apparatus for continuously making an air-laid fibrous web having patterned basis weight distribution. 4,388,056, Cl. 425-83.100.

Lee, Ja H.: *See*—
United States of America, National Aeronautics and Space Administration; Lee, Ja H.; and Hohl, Frank, 4,388,542, Cl. 310-11.000.

Lefavour, David W. Bicycle lighting system. 4,388,559, Cl. 315-78.000.

Legg, Peter George: *See*—
Cocker, Michael J., 4,387,917, Cl. 292-40.000.

Lehmann, Klaus: *See*—
Kraemer, Dieter; Lehmann, Klaus; and Hartl, Roland, 4,388,271, Cl. 422-56.000.

Lehning, Heinz: *See*—
Lamoth, Mihaly; and Lehning, Heinz, 4,388,587, Cl. 323-283.000.

Leiber, Heinz, to Robert Bosch GmbH. Hydraulic power steering system. 4,387,782, Cl. 180-132.000.

Leichti, Robert J.: *See*—
House, Cynthia B.; and Leichti, Robert J., 4,388,378, Cl. 428-537.000.

Lemery, Douglas J., to Kolve Sawchain Company. Anti-kick saw chain and a kick-reducing method. 4,387,615, Cl. 83-56.000.

Lemke, James U., to Eastman Kodak Company. Multitrack recording with minimal intermodulation. 4,388,656, Cl. 360-33.100.

Lemke, James U., to Eastman Kodak Company. Tape recorder apparatus capable of playing back selected information while recording other information. 4,388,659, Cl. 360-90.000.

Lenco, Inc.: *See*—
Blair, Bruce A., 4,388,637, Cl. 358-10.000.

Lening, George O.; and Lening, James B. Gate latch assembly. 4,387,916, Cl. 292-5.000.
Lening, James B.: *See*—
Lening, George O.; and Lening, James B., 4,387,916, Cl. 292-5.000.
Lenke, Dieter: *See*—
Steiner, Gerd; Franke, Albrecht; Lenke, Dieter; Teschendorf, Hans-Juegen; Worstmann, Wolfgang; and Kreiskott, Horst, 4,388,237, Cl. 260-239.0BC.
Lense, Robert F., to Amerock Corporation. Drawer slide assembly. 4,387,942, Cl. 312-334.000.
Lepain, Andre; Bronchart, Robert; and Remacle, Roger, to Labofina, S.A. Process and apparatus for the rapid determination of the characteristics of a petroleum pollutant. 4,388,407, Cl. 436-3.000.
Lerner, Bernard, to Automated Packaging Systems, Inc. Container strips and method of making and using the same. 4,387,550, Cl. 53-459.000.
Leto, Anthony, to Curtiss-Wright Corporation. Fuel burner and combustor assembly for a gas turbine engine. 4,387,559, Cl. 60-39.320.
Leuvelink, Gerrit W. E., to Textieltechniek Haaksbergen B.V. Method and means for winding helical coils from thermoplastic materials. 4,388,264, Cl. 264-281.000.
Leveques, Marc, to Clesid S.A. Changeover device for an installation for recovery of the gases and fumes proceeding from a converter. 4,387,883, Cl. 266-158.000.
Levey, Bertram J., to Construction Materials, Inc. Expansion joint and seal for use in concrete structures. 4,388,016, Cl. 404-48.000.
Levi Strauss & Co.: *See*—
Blessing, Hubert, 4,388,141, Cl. 156-432.000.
Levin, James P.: *See*—
King, Bruce D.; and Levin, James P., 4,388,386, Cl. 430-5.000.
Levin, Liza: *See*—
Yong, Samuel H.; Anderson, George R.; and Levin, Liza, 4,388,336, Cl. 426-551.000.
Lewandowski, Raymond J.; and Spector, George. Book end planter. 4,387,534, Cl. 47-66.000.
Lewerenz, Hans-Joachim: *See*—
Bachmann, Klaus J.; Lewerenz, Hans-Joachim; and Menezes, Maria T. A. S., 4,388,382, Cl. 429-111.000.
Lewin, Ian. Indirect lighting fixture. 4,388,675, Cl. 362-225.000.
Lewis, Paul H.; Durkin, Joseph A.; and Froelich, Joseph A., to Texaco Inc. Catalytic cracking process. 4,388,178, Cl. 208-115.000.
Lewis, Robert T., to Chevron Research Company. Magnetic separation of mineral particles from shale oil. 4,388,179, Cl. 208-177.000.
Licata, Joseph G. Contact lens application. 4,387,921, Cl. 294-1.0CA.
Licentia Patent-Verwaltungs-GmbH: *See*—
Gockler, Heinz, 4,388,724, Cl. 375-14.000.
Goseberg, Walter; Pollak, Alfred; and Reichow, Wolfgang, 4,388,568, Cl. 315-411.000.
Scheffler, Hartmut, 4,388,497, Cl. 179-77.000.
Schmidtmann, Burchard, 4,388,650, Cl. 358-197.000.
Lillibridge, Harold R.: *See*—
Sullivan, John; and Lillibridge, Harold R., 4,388,071, Cl. 493-333.000.
Lin, Gregory K.: *See*—
Hoge, Carl E.; and Lin, Gregory K., 4,388,132, Cl. 156-153.000.
Lincoln Laser Co.: *See*—
Sherman, Randy J., 4,388,651, Cl. 358-206.000.
Linde Aktiengesellschaft: *See*—
Dresler, Helmut; and Turnwald, Ernst, 4,388,051, Cl. 417-505.000.
Lindemann, Karl-Heinz: *See*—
Acimovic, Simeon; Lindemann, Karl-Heinz; and Kunz, Volker G., 4,388,161, Cl. 204-43.00S.
Linhart, Heinz: *See*—
Bachmann, Adolf; Boehler, Joachim; and Linhart, Heinz, 4,388,057, Cl. 425-97.000.
Linnau, Yendra: *See*—
Eibl, Johann; Elsinger, Fritz; and Linnau, Yendra, 4,388,232, Cl. 260-112.00B.
Lion Corporation: *See*—
Suzuki, Shin-ichi; Kitoh, Shinya; Toda, Haruhiko; and Higo, Moriaki, 4,388,421, Cl. 523-118.000.
Lionetti, Thomas A.; and Schrader, Charles H., to Texaco Inc. Hydrocarbon conversion process. 4,388,175, Cl. 208-74.000.
Lister, Marc D., to Felt Products Mfg. Co. Gasket screening assembly for an internal combustion engine having an auxiliary oil cooler. 4,387,764, Cl. 165-119.000.
Lister, Neil K.: *See*—
Rosato, Dennis W.; and Lister, Neil K., 4,388,366, Cl. 428-285.000.
Livingston, Douglas J.: *See*—
Brastow, Carl H.; Mallett, Joel D.; and Livingston, Douglas J., 4,388,513, Cl. 219-58.000.
Loch, Werner, to BASF Aktiengesellschaft. Aqueous pigment pastes and their use. 4,388,435, Cl. 524-548.000.
Loevendie, Rudolf H., to IHC Holland N.V. Method for controlling the position of the suction head of a dredge in relation to the bottom. 4,387,519, Cl. 37-195.000.
Loew, Harold F.: *See*—
Penland, William D.; and Loew, Harold F., 4,388,503, Cl. 200-5.00R.
Lohstroh, Jan, to U.S. Philips Corporation. Static memory cell and memory constructed from such cells. 4,388,636, Cl. 357-49.000.
Loire, Rene, to Morrison-Knudsen Company, Inc. Single point mooring. 4,387,660, Cl. 114-230.000.
Lomneth, Richard B.; Blair, Daniel R.; Parnell, Gary L.; and Tao, Bernard Y., to Procter & Gamble Company, The. Margarine and method for making same. 4,388,339, Cl. 426-602.000.
Long, James L.: *See*—
de Figueiredo, Mario P.; Guevara, Balagtas F.; Long, James L.; Morgan, Ronnie G.; and York, Lawrence R., 4,388,340, Cl. 426-614.000.
Long, Richard W.; and Stinton, Robert T., to Diving Unlimited International, Inc. Underwater diver's dry suit and method of sealing. 4,388,134, Cl. 156-248.000.
Longo, Frank N.; Miller, Robert A.; and Reardon, Joseph D., to Metco, Inc. Coating plastic substrates with minerals. 4,388,373, Cl. 428-413.000.
Longo, John M.: *See*—
Poeppelmeier, Kenneth R.; and Longo, John M., 4,388,294, Cl. 423-599.000.
Longoni, Angelo: *See*—
Massardo, Pietro; Longoni, Angelo; and Piccardi, Paolo, 4,388,323, Cl. 424-305.000.
Longwell, John P.: *See*—
Bartok, William; Song, Yih H.; Siminski, Vince J.; and Longwell, John P., 4,388,062, Cl. 431-10.000.
Losiello, Peter J., to General Signal Corporation. Insulating module including a heater element support. 4,387,871, Cl. 248-58.000.
Loranger Manufacturing Company: *See*—
Soltysik, George E.; and Anderson, John C. R., 4,388,719, Cl. 371-27.000.
Lorenz, Hellmut, to Barmag Barmer Maschinenfabrik AG. False twisting apparatus and method. 4,387,557, Cl. 57-340.000.
Lostumo, Arthur J.; and Pulchinski, Steven J., to Zenith Radio Corporation. High voltage connector. 4,387,947, Cl. 339-90.00R.
Love, Roger R.; and Metroke, John, to Computer Power, Inc. Uninterruptible power supply. 4,388,534, Cl. 307-66.000.
Loveland, Robert S., to Perkin-Elmer Corp., The. Circuitry for simultaneously performing integration and division. 4,388,694, Cl. 364-834.000.
Lovelock, James E., to Hewlett-Packard Company. Apparatus and method for detecting fluid. 4,388,411, Cl. 436-149.000.
Lowder, Robert L., to Occidental Chemical Agricultural Products, Inc. Non-pressure nitrogen carrier fertilizer solutions and dispersions and process of manufacture. 4,388,101, Cl. 71-29.000.
Lubecki, Andrzej; Wiese, Kurt; and Winkler, Karl, to Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung. Process and apparatus for the continuous measurement of element contents. 4,388,530, Cl. 378-45.000.
Lucas Industries, Limited: *See*—
Farr, Glyn P. R., 4,387,934, Cl. 303-116.000.
Hembert, Gaetan, 4,388,142, Cl. 156-446.000.
Lucia, Carroll J., to Patalidis, Claude A. Filter with heat controlled fluid flow bypass. 4,388,196, Cl. 210-742.000.
Ludman, Jacques E.; Horner, Joseph L.; and Mikes, Thomas L., to United States of America, Air Force. Holographic reflective grating multiplexer/demultiplexer. 4,387,955, Cl. 350-96.190.
Luebke, Robert W., to True Temper Corporation. Sheet useful as a reservoir liner. 4,388,357, Cl. 428-57.000.
Lukezic, Marino: *See*—
Plevnik, Stanislav; Vrtacnik, Peter; Malezic, Matija; Lukezic, Marino; Stanic, Uros; and Oblak, Pavel, 4,387,719, Cl. 128-421.000.
Lumikko, Juha, to Enso-Gutzeit Oy. Procedure for separating finely divided matter from a suspension by filtering. 4,388,197, Cl. 210-777.000.
Lumsden, James R., to AEL Microtel Limited. Automatic meter reading transponder. 4,388,690, Cl. 364-483.000.
Lungu, Corneliu, to Robert Bosch GmbH. Arrangement for controlling elements of power vehicle such as safety belt, window pane and the like. 4,388,575, Cl. 318-475.000.
Lunn, William H. W.; and Wheeler, William J., to Eli Lilly and Company. Amino-substituted oxazole, oxadiazole and isoxazole-substituted cephalosporins. 4,388,316, Cl. 424-246.000.
Luostarinen, Raimo: *See*—
Kroger, Tapani; and Luostarinen, Raimo, 4,387,908, Cl. 280-63.000.
Lynn, Joe J.: *See*—
Hayman, Richard W.; Goldstein, Burton; Lynn, Joe J.; Brown, Robert J.; and Bugash, Robert S., 4,388,689, Cl. 364-401.000.
Lynn, Robert W., to Becton, Dickinson and Company. Container and closure assembly having intermediate positioning means. 4,387,822, Cl. 215-330.000.
Lyons, Bernard J.: *See*—
Toy, Lester T.; Moyer, Wendell W.; Lyons, Bernard J.; and Horsma, David A., 4,388,607, Cl. 338-22.0SD.
Lytle, James R., Sr.: *See*—
Stevens, Samuel B.; and Lytle, James R., Sr., 4,387,842, Cl. 226-113.000.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Fischer, Hermann, 4,387,647, Cl. 101-350.000.
Ma, Kwok C. Automatic egg roll making machine. 4,388,059, Cl. 425-112.000.
MacAvoy, David W., to Bendix Corporation, The. Electrical connector insert. 4,387,945, Cl. 339-59.00R.
MacAvoy, David W.: *See*—
Werth, Dee A.; Schildkraut, Alan L.; and MacAvoy, David W., 4,387,943, Cl. 339-59.00R.
Machida, Haruchika, to Hochiki Corporation. Fire detection system with programmed sensitivity changes. 4,388,616, Cl. 340-587.000.
Machida, Shigeki; and Makita, Takeo, to Kabushiki Kaisha Saginomiya Seisakusho. Defrost thermostat used in a reversible refrigerating cycle for heat pumps. 4,388,605, Cl. 337-301.000.

Machlett Laboratories, Incorporated, The: *See*—
Emmanuel, Saarabh D., 4,388,728, Cl. 378-34.000.

MacKenzie, Angus B.: *See*—
Cayton, David W.; Armstrong, Errol C.; and MacKenzie, Angus B., 4,388,035, Cl. 414-417.000.

MacNaughton, Robert G.: *See*—
Sneed, Robert C., Jr.; MacNaughton, Robert G.; and Jacobsen, James H., 4,388,601, Cl. 333-227.000.

Macro Engineering Company Ltd.: *See*—
Bebok, Janos B., 4,388,061, Cl. 425-392.000.

MacWilliams, Robert W.: *See*—
Brouthers, Paul E.; and MacWilliams, Robert W., 4,387,526, Cl. 42-59.000.

Maerfeld, Charles: *See*—
Gautier, Herve; and Maerfeld, Charles, 4,388,599, Cl. 333-150.000.

Maes, Michel E.; Shaw, Robert L.; and Reinsch, Royal L., to Energy Sciences Partners, Ltd. System for making a homogeneous aqueous slurry-type blasting composition. 4,388,254, Cl. 264-3.00C.

Mag Instrument, Inc.: *See*—
Maglica, Anthony, 4,388,673, Cl. 362-183.000.

Maganjuk, Anatoly P.: *See*—
Gryaznov, Vladimir M.; Karavanov, Andrei N.; Belosljudova, Tamara M.; Ermolaev, Anatoly V.; Maganjuk, Anatoly P.; and Saryeheva, Irina K., 4,388,479, Cl. 568-828.000.

Magedanz, Norbert; Seidel, Horst; and Weiss, Hans J., to Metallgesellschaft Aktiengesellschaft. Process of recovering oil from oil-containing minerals. 4,388,174, Cl. 208-11.00R.

Magin, Irving J.; and Nelson, Erik K., to Itek Corporation. Unique copyboard having unique light attenuator. 4,387,985, Cl. 355-71.000.

Maginnes, Edward A.: *See*—
Green, George H.; and Maginnes, Edward A., 4,387,533, Cl. 47-17.000.

Maglica, Anthony, to Mag Instrument, Inc. Variable light beam flashlight and recharging unit. 4,388,673, Cl. 362-183.000.

Maher, William M., to Quaker Oats Company, The. Toy inertia motor. 4,387,604, Cl. 74-354.000.

Maier, Klaus, to Strohm & Maier Labormobel GmbH. Work place arrangement. 4,387,941, Cl. 312-194.000.

Maier, Roland: *See*—
Wetzel, Bernd; Woitun, Eberhard; Maier, Roland; Reuter, Wolfgang; Lechner, Uwe; and Goeth, Hanns, 4,388,315, Cl. 424-246.000.

Maisel, Douglas A. In-band signaling system for FM transmission systems. 4,388,493, Cl. 179-1.0GD.

Major, Emery. Fluid control apparatus. 4,387,736, Cl. 137-550.000.

Makinen, Tuula S. M.: *See*—
Talonen, Timo T.; and Makinen, Tuula S. M., 4,388,111, Cl. 75-26.000.

Makino, Shigeo: *See*—
Matsuda, Hideki; Makino, Shigeo; and Sugimura, Noboru, 4,387,758, Cl. 152-353.00R.

Makita, Takeo: *See*—
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Malatesta, Vincenzo; Willis, Clive; and Hackett, Peter A., to Canadian Patents & Development Limited. Method of production of vitamin-D. 4,388,242, Cl. 260-397.200.

Malezic, Matija: *See*—
Plevnik, Stanislav; Vrtacnik, Peter; Malezic, Matija; Lukezic, Marino; Stanic, Uros; and Oblak, Pavel, 4,387,719, Cl. 128-421.000.

Mallett, Joel D.: *See*—
Brastow, Carl H.; Mallett, Joel D.; and Livingston, Douglas J., 4,388,513, Cl. 219-58.000.

Mallinckrodt, Inc.: *See*—
Merry, Jack D., 4,387,711, Cl. 128-207.150.

Manco Tape, Inc.: *See*—
Corbo, Thomas A., 4,387,535, Cl. 49-468.000.

Mangels, John A.; and Baer, John R., to Ford Motor Company. Thermally stable silicon nitride material. 4,388,414, Cl. 501-98.000.

Mangum, U. Stancel. Ball game apparatus and method. 4,387,898, Cl. 273-411.000.

Manitowoc Company, Inc., The: *See*—
Beduhn, Daniel E.; and Morrow, James G., Sr., 4,387,813, Cl. 212-195.000.
Beduhn, Daniel E.; and Morrow, James G., Sr., 4,387,814, Cl. 212-195.000.

Mann, William W.: *See*—
Young, Terry A.; Mann, William W.; Kline, Charles M.; and Schoeneberger, Ernest A., 4,387,857, Cl. 241-101.00B.

Mannesmann Tally Corporation: *See*—
Bringhurst, Edward D.; and Miller, Swend L., 4,387,642, Cl. 101-93.040.

Manning, John W., Jr.: *See*—
Koyama, Shozo; Manning, John W., Jr.; Ammons, William S.; and Santiesteban, Hector L., 4,388,318, Cl. 424-251.000.

Mansour, Alex E.; and Bridgwater, Jon D. Cattle guard construction and method. 4,387,882, Cl. 256-17.000.

Marathon Oil Company: *See*—
Hill, Alfred D., 4,387,770, Cl. 166-305.00R.

Marconi Company Limited, The: *See*—
Crook, Richard W.; and Coghill, Ian, 4,388,623, Cl. 343-709.000.

Marcoux, Leo; and Ting, Youn, to Texas Instruments Incorporated. Diesel fuel filter system. 4,387,691, Cl. 123-557.000.

Margulies, Herman, to Sterling Drug Inc. Pre-moistened towelette dispensing package including flexibly adjustable tie device. 4,387,832, Cl. 221-63.000.

Mariel, James: *See*—
Choby, David; Crawford, James; and Mariel, James, 4,387,923, Cl. 296-201.000.

Marinakis, James. Table apparatus. 4,387,888, Cl. 269-324.000.

Marroquin, Elio G., to Vitro Tec Fideicomiso. Shear mechanism for machines for the manufacture of articles of glass or other materials. 4,388,100, Cl. 65-334.000.

Marshall, Albert H.; and Bond, Gary M., to United States of America, Navy. Circuit for calculating the position of the eye. 4,387,974, Cl. 351-210.000.

Martens, Karlo P., to U.S. Philips Corporation. Combustion flash bulb. 4,388,065, Cl. 431-362.000.

Martin, Earl C.; Thompson, John K.; and Gargrave, Robert J., to Ready Systems, Inc. Bending and forming tool. 4,387,583, Cl. 72-22.000.

Martin, Henry: *See*—
Fory, Werner; Martin, Henry; and Pissiotas, Georg, 4,388,106, Cl. 71-105.000.

Martin, John R., to Foxboro Company, The. Apparatus for maintaining clean optical surfaces in process environments. 4,387,973, Cl. 350-582.000.

Martin Marietta Corporation: *See*—
Simon, Wayne E., 4,388,045, Cl. 417-54.000.

Martin, Michael R.: *See*—
Hopper, Michael J.; Martin, Michael R.; Bolt, Lawrence; Smith, Michael; and Tavasolian, Ali, 4,388,375, Cl. 428-423.700.

Maruta, Keiichi: *See*—
Iwata, Susumu; Maruta, Keiichi; and Yuyama, Yukihiro, 4,388,362, Cl. 428-211.000.

Maryland Cup Corporation: *See*—
Cowan, David A., 4,387,551, Cl. 53-478.000.

Maschinenbau Oppenweiler Binder GmbH & Co.: *See*—
Klenk, Emil, 4,388,073, Cl. 493-444.000.

Masegi, Koichi, to Canon Kabushiki Kaisha. Scan type image recording apparatus. 4,387,983, Cl. 355-8.000.

Mashikhin, Anatoly D.: *See*—
Shipaev, Gennady A.; Seliverstov, Vyacheslav V.; Osipov, Nikolai A.; Prolygin, Anatoly P.; Mashikhin, Anatoly D.; Askinazi, Mikhail P.; Andreev, Jury M.; and Kagan, Samuil I., 4,388,569, Cl. 318-87.000.

Mashyanov, Vladimir G.: *See*—
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.

Maslanka, William W., to Hercules Incorporated. Wet-strength resin for paper and method of preparing same. 4,388,439, Cl. 524-845.000.

Massachusetts Institute of Technology: *See*—
Rinderle, James R., 4,387,762, Cl. 165-1.000.

Massardo, Pietro; Longoni, Angelo; and Piccardi, Paolo, to Montedison S.p.A. Acaricide compounds. 4,388,323, Cl. 424-305.000.

Masuda, Seiichi: *See*—
Okane, Koji; Okamura, Shozo; Sueyasu, Masanobu; Masuda, Seiichi; Tanaka, Tsutomu; and Tanaka, Koichi, 4,388,084, Cl. 48-197.00R.

Matburn (Holdings) Limited: *See*—
Briggs, Peter J.; and Carpenter, Steven, 4,387,712, Cl. 604-333.000.

Mathews, James K., to Pertron Controls Corporation. Resistance welding control system. 4,388,515, Cl. 219-110.000.

Mathieson, Donald E.: *See*—
Rigazio, Anthony W.; Mathieson, Donald E.; and Hawkinson, Paul E., 4,388,002, Cl. 368-88.000.

Matlack, Gary L.: *See*—
Deskins, Robert L.; Matlack, Gary L.; and Ashbaugh, Robert D., 4,388,594, Cl. 324-348.000.

Matsubara, Tetsuyuki: *See*—
Iwamoto, Mune; Ito, Norifumi; Ishida, Yuzuru; Furuta, Yasuo; and Matsubara, Tetsuyuki, 4,388,447, Cl. 525-316.000.

Matsubara, Toru: *See*—
Nishikawa, Syuzi; Matsubara, Toru; Iida, Kazuyoshi; and Tahara, Seiichiro, 4,388,427, Cl. 523-500.000.

Matsuda, Hideki; Makino, Shigeo; and Sugimura, Noboru, to Bridgestone Tire Company Limited. Heavy duty pneumatic low-sectional radial tire. 4,387,758, Cl. 152-353.00R.

Matsuda, Motonobu; and Tanaka, Yoshihiro, to Minolta Camera Kabushiki Kaisha. Automatic distance measuring device. 4,387,988, Cl. 356-1.000.

Matsumoto, Muneaki: *See*—
Kuno, Akira; Matsumoto, Muneaki; and Numata, Koji, 4,388,666, Cl. 361-149.000.

Matsumoto, Osamu; and Aoki, Ichizo, to Chiyoda Chemical Engineering & Construction. Method for processing LNG for Rankine cycle. 4,388,092, Cl. 62-24.000.

Matsuno, Mitsuo: *See*—
Imai, Hirosuke; Matsuno, Mitsuo; and Kudoh, Michio, 4,388,480, Cl. 585-516.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kajino, Jirou; Minabe, Hitoshi; and Murata, Shigeki, 4,388,658, Cl. 360-85.000.
Ogawa, Kazufumi; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, 4,388,128, Cl. 156-64.000.
Sekido, Satoshi; and Sotomura, Tadashi, 4,388,385, Cl. 429-111.000.

Sugano, Nobukazu, 4,387,793, Cl. 192-0.02R.
Matsushita Electric Works, Ltd.: *See*—
Hirao, Shozo; Saihara, Yasuhiro; Nakanishi, Toshio; Ihara, Ichiro; and Sano, Yoshio, 4,388,133, Cl. 156-245.000.
Kurita, Yukio; and Nakagawa, Satoshi, 4,387,546, Cl. 52-731.000.
Mattel, Inc.: *See*—
Murphy, Jack P., deceased; and Kimmell, Steven D., 4,387,702, Cl. 126-424.000.
Mattson, Charles A.; Michel, James; and Domagalski, Anthony, to Allegretti & Co. Fertilizer spreader. 4,387,852, Cl. 239-143.000.
Matty, Thomas C.; Franz, James H., Jr.; and Parham, Carol D., to Westinghouse Electric Corp. Transit vehicle shunt determination. 4,387,870, Cl. 246-122.00R.
Maublanc, Georges, to Post-A-Mousson S.A. Modular single or double action door closure system. 4,387,482, Cl. 16-64.000.
Mauric, Claudine; and Wolf, Rainer, to Sandoz Ltd. Flameproofed organic materials. 4,388,431, Cl. 524-119.000.
Maurice, Terrence J.; Murray, Edward D.; and Agnes, Jennifer M., to General Foods Inc. Simulated adipose tissue. 4,388,333, Cl. 426-104.000.
Mauz, Wolfgang. Mixing block for explosive gas mixtures detonated in a combustion chamber. 4,388,083, Cl. 48-180.00R.
Mavilor Systemes: *See*—
Coquillart, Michel, 4,387,504, Cl. 29-598.000.
Maxwell, Thomas J. Liquid collecting and dispensing apparatus. 4,388,253, Cl. 261-88.000.
Mayer, Joseph B.: *See*—
Ragir, Meyer J.; and Mayer, Joseph B., 4,387,811, Cl. 211-119.000.
McArthur, James F.: *See*—
Ishman, Neal H.; Buxton, Robert B.; Durst, Duane A.; McArthur, James F.; and Johnson, Michael E., 4,388,644, Cl. 358-84.000.
McBrayer, Robert L., to BASF Wyandotte Corporation. Process for preparing a microcellular polyurethane foam with improved green strength. 4,388,420, Cl. 521-127.000.
McCarty, William H.; Guarino, John P.; and Nagy, Frank A., to Mobil Oil Corporation. Process for transfer coating with radiation-curable compositions. 4,388,137, Cl. 156-275.500.
McCaskill, James N., Jr., to Dresser Industries, Inc. Method for drying oil well drill cuttings. 4,387,514, Cl. 34-31.000.
McClure, Don W., to Rockwell International Corporation. Method for manufacturing a simulated wire wheel cover. 4,387,494, Cl. 29-159.00A.
McClure, Richard J.: *See*—
Jeffers, Frederick; and McClure, Richard J., 4,388,662, Cl. 360-113.000.
McCrady, Paul E.: *See*—
Reif, Robert B.; and McCrady, Paul E., 4,388,089, Cl. 55-119.000.
McDonnell Douglas Corporation: *See*—
Arrazola, Ignacio M.; Brown, Raymond E.; and Dillard, Homer E., 4,387,964, Cl. 350-331.00R.
McDuffie, Thomas F. Barge jacking apparatus. 4,387,881, Cl. 254-89.00H.
McGinley, Thomas J.: *See*—
Sien, Herbert P.; and McGinley, Thomas J., 4,388,408, Cl. 436-60.000.
McGraw-Edison Company: *See*—
Hassler, Stephen P.; and Sokoly, Theodore O., 4,388,603, Cl. 337-158.000.
McIntosh, John O.: *See*—
Jones, James J.; and McIntosh, John O., 4,388,692, Cl. 364-557.000.
McKeachern, Jeanette O.: *See*—
Ott, Norman; and McKeachern, Jeanette O., 4,388,185, Cl. 210-136.000.
McNally, Claire O.: *See*—
McNally, John F., 4,387,831, Cl. 221-25.000.
McNally, John F., to McNally, Claire O. Container for dispensing articles carried on a web. 4,387,831, Cl. 221-25.000.
McNerney, Robert. Sewer clean out device. 4,387,750, Cl. 141-331.000.
McNulty, Hugh, Jr.: *See*—
Robinson, William P.; McNulty, Hugh, Jr.; Seliger, Robert L.; and Williamson, Weldon S., 4,388,560, Cl. 315-111.810.
McPhee, William A., to Dresser Industries, Inc. Shaped charge well perforator. 4,387,773, Cl. 175-4.600.
McWilliams, Joseph A., to Micropore International Ltd. Electric cookers with warning lights. 4,388,520, Cl. 219-464.000.
Mechanical Technology Incorporated: *See*—
Berchowitz, David M., 4,387,566, Cl. 60-518.000.
Dineen, John J., 4,387,568, Cl. 60-520.000.
White, Harlan V., 4,387,567, Cl. 60-520.000.
Meder, Siegfried R.: *See*—
Natarajan, Cuddalore P.; and Meder, Siegfried R., 4,388,066, Cl. 432-1.000.
Medical Center Prosthetics, Inc.: *See*—
Wilson, Michael T., 4,387,472, Cl. 3-32.000.
Medical Engineering Corporation: *See*—
Finney, Roy P., 4,387,705, Cl. 128-1.00R.
Medtronic, Inc.: *See*—
Bilitz, Mark R.; and Dickson, Dale A., 4,387,718, Cl. 128-419.00R.
Sandstrom, Richard D., 4,387,727, Cl. 128-784.000.
Meehan, James B.: *See*—
Roach, Maurice P.; Burkhart, Russell D.; and Meehan, James B., 4,387,537, Cl. 51-17.000.
Meehan, James E., to Slater Electric Inc. Wire separation tool and method of preparing multiconductor cable. 4,387,746, Cl. 140-105.000.
Meeks, Alan M. G.: *See*—
Blackburn, Neil P.; Piper, Alfred E. C.; and Meeks, Alan M. G., 4,387,490, Cl. 24-200.000.
Mefferd, Roy J. Method and apparatus for holding and cooling a metal tube during welding. 4,387,845, Cl. 228-222.000.
Mehrotra, Gopi N., to RCA Corporation. Video disc player with selectively enabled audio signal expander circuitry. 4,388,654, Cl. 358-343.000.
Meier, Heinz; and Zurawski, Egon, to Triumph-Adler A.G. fur Buro- und Informationstechnik. Line feed carrier return mechanism for movable printing point typewriter. 4,388,007, Cl. 400-314.000.
Meinardi, Giuseppe: *See*—
Nannini, Giuliano; Perrone, Ettore; Severino, Dino; Meinardi, Giuseppe; Monti, Gisella; Bianchi, Alberta; Forgione, Angelo; and Confalonieri, Carlo, 4,388,314, Cl. 424-246.000.
Meining, Hans: *See*—
Walter, Lothar; Olschewski, Armin; Kispert, Klaus; and Meining, Hans, 4,387,939, Cl. 308-217.000.
Melby, Lester R., to Du Pont de Nemours, E. I., and Company. Glycidyl methacrylate polymers, their preparation and solvolysis products. 4,388,448, Cl. 525-327.300.
Mendenhall, Robert L. Batch method of recycling asphaltic concrete. 4,387,996, Cl. 366-4.000.
Menezes, Maria T. A. S.: *See*—
Bachmann, Klaus J.; Lewerenz, Hans-Joachim; and Menezes, Maria T. A. S., 4,388,382, Cl. 429-111.000.
Menke, W. Kenneth, to Public Safety Equipment Company. Signal light with precessing oscillation control. 4,388,609, Cl. 340-84.000.
Mennicke, Stefan; and Weddigen, Gert, to Brown, Boveri & Cie AG. Electrochemical storage cell. 4,388,381, Cl. 429-104.000.
Mercil, Robert A. Absorbent device for containers for sugar, salt, etc. 4,387,803, Cl. 206-204.000.
Merck & Co., Inc.: *See*—
Christensen, Burton G.; DiNinno, Frank P.; Muthard, David A.; and Ratcliffe, Ronald W., 4,388,310, Cl. 424-200.000.
Field, A. Kirk; Tytell, Alfred A.; and Lampson, George P., 4,388,306, Cl. 424-177.000.
Firestone, Raymond A., 4,388,326, Cl. 424-335.000.
Firestone, Raymond A., 4,388,475, Cl. 564-341.000.
Merrell Toraude et Compagnie: *See*—
Bey, Philippe; and Jung, Michel, 4,388,466, Cl. 548-337.000.
Merry, Jack D., to Mallinckrodt, Inc. Medical device with inflatable cuff. 4,387,711, Cl. 128-207.150.
Mesek, Frederick K.; and Mesek, Virginia R., to Johnson & Johnson Baby Products Company; and Johnson & Johnson Baby Products Company. Disposable diaper with wide elastic gathering means for improved comfort. 4,388,075, Cl. 604-385.000.
Mesek, Virginia R.: *See*—
Mesek, Frederick K.; and Mesek, Virginia R., 4,388,075, Cl. 604-385.000.
Metal Box Limited: *See*—
Franek, Josef T.; Porucznik, Paul; and Styles, Alan E., 4,387,747, Cl. 141-1.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Magedanz, Norbert; Seidel, Horst; and Weiss, Hans J., 4,388,174, Cl. 208-11.00R.
Metcalf, Eric, to Sangamo Weston Limited. Receivers suitable for use in remotely-operable switching devices and data transmission systems. 4,388,727, Cl. 375-88.000.
Metco, Inc.: *See*—
Longo, Frank N.; Miller, Robert A.; and Reardon, Joseph D., 4,388,373, Cl. 428-413.000.
Metroke, John: *See*—
Love, Roger R.; and Metroke, John, 4,388,534, Cl. 307-66.000.
Metz, Paul, to Arbed S.A. Nozzle for rotary continuous caster. 4,387,761, Cl. 164-437.000.
Meunier, Pierre, to Sodex-Magister. Key operated lock for securing a movable portion of a motor vehicle. 4,387,582, Cl. 70-186.000.
Meyer, E. Robert, to Keene Corporation. Hazardous location light fixture. 4,388,681, Cl. 362-374.000.
Meyer-Pittroff, Roland: *See*—
Becker, Bernard; Meyer-Pittroff, Roland; and Frohlich, Gunter, 4,387,574, Cl. 60-641.110.
Michel, James: *See*—
Mattson, Charles A.; Michel, James; and Domagalski, Anthony, 4,387,852, Cl. 239-143.000.
Micropore International Ltd.: *See*—
McWilliams, Joseph A., 4,388,520, Cl. 219-464.000.
Mieczkowska, Ewa: *See*—
Knypl, Maria; Knypl, Eugeniusz; Starzak, Marian; Mieczkowska, Ewa; Pawlus, Urszula; Palubicki, Romuald; Ficek, Mieczyslaw; and Goldynia, Jozef, 4,388,438, Cl. 524-833.000.
Mieszkis, Kazimierz W.: *See*—
Ellis, Vincent S.; and Mieszkis, Kazimierz W., 4,388,370, Cl. 428-368.000.
Mignien, Georges, to Societe Anonyme dite: Compagnie Lyonnaise de Trandmissions Optiques. Connector for optical fibres. 4,387,957, Cl. 350-96.210.
Mikes, Thomas L.: *See*—
Ludman, Jacques E.; Horner, Joseph L.; and Mikes, Thomas L., 4,387,955, Cl. 350-96.190.
Mikoshiba, Hitoshi; Fujimori, Kazuyoshi; Onodera, Kenji; and Takeuchi, Shin, to Shinshu Seiki Kabushika Kaisha; and Kabushiki Kaisha Suwa Seikosha. Small printer. 4,387,643, Cl. 101-110.000.
Miller, Albert T., to Devro, Inc. Collagen sausage casing. 4,388,331, Cl. 426-63.000.

Miller, David G., to Hewlett-Packard Company. Transducer acoustic lens. 4,387,720, Cl. 128-660.000.

Miller, John H., to Hy-Way Heat Systems, Inc. Hot oil heater with helical coil baffle. 4,387,766, Cl. 165-172.000.

Miller, Robert A.: *See*—
Longo, Frank N.; Miller, Robert A.; and Reardon, Joseph D., 4,388,373, Cl. 428-413.000.

Miller, Ross, to ProCreations, Inc. Flexible sheet construction system. 4,387,530, Cl. 46-1.00L.

Miller, Swend L.: *See*—
Bringburst, Edward D.; and Miller, Swend L., 4,387,642, Cl. 101-93.040.

Milliken Research Corportion: *See*—
Sanders, Kenneth H., 4,388,364, Cl. 428-253.000.

Milwaukee Boiler Manufacturing Co.: *See*—
Stevens, Richard W., 4,387,928, Cl. 299-33.000.

Minabe, Hitoshi: *See*—
Kajino, Jirou; Minabe, Hitoshi; and Murata, Shigeki, 4,388,658, Cl. 360-85.000.

Minagawa, Yoshisato: *See*—
Hasebe, Kazunori; and Minagawa, Yoshisato, 4,388,401, Cl. 430-505.000.

Minami, Shunsuke: *See*—
Ishida, Masamichi; Kamo, Jun; Takemura, Toru; Minami, Shunsuke; and Kamada, Kensuke, 4,388,256, Cl. 264-41.000.

Minamikawa, Yoshitugu: *See*—
Sugano, Junichiro; Yui, Tomoyuki; Minamikawa, Yoshitugu; and Fujimoto, Tsuneo, 4,388,287, Cl. 423-415.00P.

Minden, Carl S. Multi-mode solar heat recovery device. 4,387,704, Cl. 126-435.000.

Minematsu, Hiroyoshi: *See*—
Kawaguchi, Takeyuki; Minematsu, Hiroyoshi; Hayashi, Yuzuru; and Hara, Shigeyoshi, 4,388,189, Cl. 210-490.000.

Minnesota Mining and Manufacturing Company: *See*—
Ethen, John L.; and Bredahl, Timothy D., 4,388,359, Cl. 428-143.000.

Minnick, Larry A.: *See*—
Barbee, Robert B.; and Minnick, Larry A., 4,388,456, Cl. 528-289.000.

Minolta Camera Co. Ltd.: *See*—
Tani, Hakuzo, 4,387,960, Cl. 350-164.000.
Yamazaki, Yasuo; Kimura, Kazuo; and Tanimoto, Tetuyuki, 4,387,967, Cl. 350-423.000.

Minolta Camera Kabushiki Kaisha: *See*—
Matsuda, Motonobu; and Tanaka, Yoshihiro, 4,387,988, Cl. 356-1.000.

Mirman, Alfred H.: *See*—
Schiffmann, Robert F.; Mirman, Alfred H.; Grillo, Richard J.; and Batey, Robert W., 4,388,335, Cl. 426-243.000.

Mirtain, Henri J.; and Zinnen, Norbert, to Pneu Uniroyal Englebert; and Uniroyal Englebert Reifen GmbH, a part interest. Tire tread pattern. 4,387,754, Cl. 152-209.00R.

Mr. John F. Sieberth: *See*—
Wiles, Laurence E.; Page, Frank C., III; and Eibensteiner, Bruno A., 4,387,817, Cl. 215-217.000.

Mita Industrial Co., Ltd.: *See*—
Kato, Yoshiaki; and Fushida, Akira, 4,388,392, Cl. 430-58.000.
Koyama, Shigeo; Yamagata, Ryutaro; Kozuka, Nobuhiko; and Sakata, Hiromi, 4,387,889, Cl. 271-10.000.
Nishibayashi, Hatsumi; Amagai, Yoshimi; Hikake, Norio; Kouchi, Toshihiro; and Aizawa, Tatsuo, 4,388,396, Cl. 430-126.000.

Mitchell, Alexander R.: *See*—
Bissell, Eugene R.; Mitchell, Alexander R.; Pearson, Karen W.; and Smith, Robert E., 4,388,233, Cl. 260-112.50R.

Mitrofanov, Viktor A.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.

Mitsubishi Chemical Industries Ltd.: *See*—
Oguri, Yasuo; Awata, Mitsuru; and Abe, Mitsunobu, 4,388,257, Cl. 264-82.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Uchikawa, Fusaoki, 4,388,377, Cl. 428-446.000.

Mitsubishi Gas Chemical Co., Inc.: *See*—
Arakawa, Satoshi, 4,388,291, Cl. 423-515.000.
Sugano, Junichiro; Yui, Tomoyuki; Minamikawa, Yoshitugu; and Fujimoto, Tsuneo, 4,388,287, Cl. 423-415.00P.

Mitsubishi Paper Mills, Ltd.: *See*—
Torii, Takahiro; and Senoh, Hideaki, 4,387,913, Cl. 282-27.500.

Mitsubishi Rayon Company Ltd.: *See*—
Kishida, Kazuo; Sasaki, Isao; Kushi, Kenji; and Tamura, Misao, 4,388,345, Cl. 427-54.100.

Mitsui Petrochemical Industries, Ltd.: *See*—
Nagano, Riichiro; and Kaneshige, Ryosuke, 4,388,202, Cl. 252-52.00A.

Mitsui Toatsu Chemicals, Inc.: *See*—
Iwamoto, Mune; Ito, Norifumi; Ishida, Yuzuru; Furuta, Yasuo; and Matsubara, Tetsuyuki, 4,388,447, Cl. 525-316.000.
Kudoh, Akihide; Kawamata, Motoo; Ohshima, Kazushi; Kotani, Makoto; Tsuda, Takeshi; and Aoki, Fukuichi, 4,388,478, Cl. 568-804.000.

Mittleman, John, to United States of America, Navy. Coil device for underwater magnetic testing. 4,388,593, Cl. 324-262.000.

Miyagi, Hideo; and Nagase, Masaomi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling the air intake of an internal combustion engine. 4,387,682, Cl. 123-339.000.

Miyamoto, Yukihiko, to Trio Kabushiki Kaisha. FM/AM Stereo receiver. 4,388,496, Cl. 179-1.0GS.

Miyashita, Kiyoshi: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,387,986, Cl. 355-75.000.

Miyazaki, Yasushi: *See*—
Nakazato, Yasuaki; Miyazaki, Yasushi; Osuga, Makoto; and Kodaira, Masao, 4,388,140, Cl. 156-345.000.

Miyoshi, Takahito; Okutu, Toshimitu; Takimoto, Masaaki; Saida, Takashi; Akashi, Goro; and Fujiyama, Masaaki, to Fuji Photo Film Company Limited. Magnetic recording medium. 4,388,360, Cl. 428-172.000.

Mizota, Toshihiro: *See*—
Takao, Kengo; Ohmachi, Mineo; Kihara, Hisatsugu; Toki, Kenshiro; Tomita, Yukio; and Mizota, Toshihiro, 4,387,562, Cl. 60-39.150.

Mizukami, Kazushi: *See*—
Komatsu, Shigeru; Mizukami, Kazushi; Tachiuchi, Tsuguji; Nagai, Kunihiko; and Koyama, Takuo, 4,388,707, Cl. 365-230.000.

Mizuno, Akira; and Suzuki, Shigeo, to Shizuoka Seiki Co., Ltd. Solenoid-operated pump. 4,388,047, Cl. 417-299.000.

Mizuno, Kotaro: *See*—
Okamoto, Eisaku; and Mizuno, Kotaro, 4,387,620, Cl. 84-1.030.

Mizuno, Tooru; and Hagisato, Yasuo, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Display intensity control apparatus. 4,388,558, Cl. 315-77.000.

Mobay Chemical Corporation: *See*—
Eppler, Richard A., 4,388,118, Cl. 106-306.000.
Thomas, Thomas J.; and Hoquet, Robert G., 4,388,078, Cl. 8-514.000.

Mobil Oil Corporation: *See*—
Bowes, Emmerson; and Pelrine, Bruce P., 4,388,177, Cl. 208-111.000.
Butcosk, Richard A., 4,388,198, Cl. 252-28.000.
Chang, Clarence D.; and Perkins, Patrick D., 4,388,461, Cl. 546-251.000.
Gentry, Larry L.; Moss, Herbert H.; Panicker, Narayana N.; Wada, William T.; and Yancey, Irvin R., 4,388,022, Cl. 405-195.000.
Givens, Wyatt W., 4,388,266, Cl. 376-164.000.
Hungerford, Gordon P., 4,388,258, Cl. 264-129.000.
McCarty, William H.; Guarino, John P.; and Nagy, Frank A., 4,388,137, Cl. 156-275.500.
Murray, James G., 4,388,440, Cl. 525-49.000.
Rankel, Lillian A.; and Valyocsik, Ernest W., 4,388,285, Cl. 423-329.000.

Mock, George E.: *See*—
Durr, Helmut E.; and Mock, George E., 4,388,029, Cl. 409-295.000.

Modern Mill, Inc.: *See*—
Gerber, Paul E., 4,387,850, Cl. 239-124.000.

Mohl, Helmut; Schab, Manfred; Sauer, Joseph; and Muller, Alfred, to Robert Bosch GmbH. Electronic control for a stepless vehicle transmission using a control member response to dynamic pressure. 4,387,608, Cl. 74-866.000.

Mohn, Hans-Werner: *See*—
Buchholz, Rainer; Mohn, Hans-Werner; Boms, Hermann; and Zodrow, Rudolf, 4,388,143, Cl. 156-475.000.

Molins Machine Company: *See*—
Evans, Donald J., 4,387,614, Cl. 83-38.000.

Moll, Eberhard; and Lardon, Marcel, to Balzers Aktiengesellschaft. Method of coating the surface of an elastic body with a continuous layer. 4,388,164, Cl. 204-192.0SP.

Molldrem, Bernhard P., Jr. Color-emitting DC level indicator. 4,388,589, Cl. 324-96.000.

Monarch Marking Systems, Inc.: *See*—
Jenkins, William A., 4,387,644, Cl. 101-111.000.

Monden, Norbert: *See*—
Hermening, Helmut; Monden, Norbert; Schaar, Lothar; Schneider, Wilhelm; and Seidel, Hans-Georg, 4,388,099, Cl. 65-267.000.

Monks, Reginald, to Radiochemical Centre Limited, The. Bile acids. 4,388,241, Cl. 260-397.100.

Monosolar, Inc.: *See*—
Basol, Bulent M.; Tseng, Eric S.; and Rod, Robert L., 4,388,483, Cl. 136-260.000.

Monsanto Company: *See*—
Purdum, William R., 4,388,102, Cl. 71-86.000.
Purdum, William R., 4,388,103, Cl. 71-86.000.
Robach, Michael C.; and Thompson, Quentin E., 4,388,321, Cl. 424-279.000.
Wise, Kenneth V., 4,388,248, Cl. 260-465.300.

Montedison S.p.A.: *See*—
Massardo, Pietro; Longoni, Angelo; and Piccardi, Paolo, 4,388,323, Cl. 424-305.000.

Monti, Gisella: *See*—
Nannini, Giuliano; Perrone, Ettore; Severino, Dino; Meinardi, Giuseppe; Monti, Gisella; Bianchi, Alberta; Forgione, Angelo; and Confalonieri, Carlo, 4,388,314, Cl. 424-246.000.

Moore, James E.: *See*—
Doremus, Robert H.; Csanak, George; Kale, B. Michael; and Moore, James E., 4,388,413, Cl. 501-40.000.

Moore, Richard F., to Combustion Engineering, Inc. Removable seal plates. 4,387,651, Cl. 110-171.000.

Moore, William C., to International Telephone and Telegraph Corporation. Luminaire for roadway lighting. 4,388,680, Cl. 362-368.000.
Moorehead, Eric L., to Union Oil Company of California. Vanadium-phosphorus-tin-mordenite oxidation catalysts. 4,388,221, Cl. 252-435.000.
Moorehead, Eric L., to Union Oil Company of California. Molybdenum-exchanged crystalline aluminosilicate zeolite. 4,388,224, Cl. 252-455.00Z.
Morgan, Howard W. Float bag hold down for a filter. 4,388,191, Cl. 210-452.000.
Morgan, Ronnie G.: *See*—
de Figueiredo, Mario P.; Guevara, Balagtas F.; Long, James L.; Morgan, Ronnie G.; and York, Lawrence R., 4,388,340, Cl. 426-614.000.
Morhard, Alfred. Method for making helically wound surface-coated tubes, and apparatus for carrying out this method. 4,387,498, Cl. 29-527.200.
Morigaki, Masakazu; Yagihara, Morio; and Ozawa, Takashi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,388,404, Cl. 430-548.000.
Moriguchi, Haruhiko; Kikuchi, Yoshiki; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Multi-color thermal transfer recorder. 4,388,628, Cl. 346-76.0PH.
Morihashi, Toshifumi: *See*—
Nakahara, Teiji; Morihashi, Toshifumi; Nakayama, Teruo; Nishimura, Shinichi; Kato, Hisaaki; Uematsu, Ikuzo; and Yoshioka, Takashi, 4,387,487, Cl. 19-249.000.
Morikawa, Tuneo: *See*—
Kato, Masaki; Morikawa, Tuneo; and Kabe, Kazuyuki, 4,387,755, Cl. 152-209.00R.
Morioka, Koitsu, to Yoshida Kogyo K.K. Method and apparatus for feeding conductive wire for anodizing process of slide fastener chain. 4,387,495, Cl. 29-408.000.
Morita, Tatsuo: *See*—
Ikeura, Kenji; and Morita, Tatsuo, 4,387,681, Cl. 123-325.000.
Moriya, Shigeru; Yoshida, Akio; Tanaka, Koichi; and Nishimura, Yuji, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho. Seatbelt system. 4,387,912, Cl. 280-804.000.
Morris, Robert D. Oil spill recovery means. 4,388,188, Cl. 210-242.300.
Morrison, Donald R. Troweling blade rotor assembly. 4,388,017, Cl. 404-112.000.
Morrison-Knudsen Company, Inc.: *See*—
Loire, Rene, 4,387,660, Cl. 114-230.000.
Morrow, James G., Sr.: *See*—
Beduhn, Daniel E.; and Morrow, James G., Sr., 4,387,813, Cl. 212-195.000.
Beduhn, Daniel E.; and Morrow, James G., Sr., 4,387,814, Cl. 212-195.000.
Morva, Tibor: *See*—
Roth, Adrian W.; and Morva, Tibor, 4,388,507, Cl. 200-148.00R.
Moseman, Merlin H., to InterNorth, Inc. Powder level measurement probe. 4,387,593, Cl. 73-290.00R.
Moss, Herbert H.: *See*—
Gentry, Larry L.; Moss, Herbert H.; Panicker, Narayana N.; Wada, William T.; and Yancey, Irvin R., 4,388,022, Cl. 405-195.000.
Mostek Corporation: *See*—
Aswell, Cecil J.; and Chapman, Hugh N., 4,387,503, Cl. 29-575.000.
Lauriello, Alfred F.; and Swendrowski, Steven D., 4,387,946, Cl. 339-66.00M.
Sheppard, Douglas P., 4,388,702, Cl. 365-104.000.
Sheppard, Douglas P., 4,388,705, Cl. 365-210.000.
Motorola Inc.: *See*—
Bickley, Robert H.; and Hunt, Albert H., 4,388,597, Cl. 331-2.000.
Guzik, Andrzej T.; and Gill, Lynn T., 4,387,950, Cl. 339-136.00M.
Javeri, Rupin J., 4,387,684, Cl. 123-416.000.
Lamoth, Mihaly, 4,388,586, Cl. 323-283.000.
Lamoth, Mihaly; and Lehning, Heinz, 4,388,587, Cl. 323-283.000.
Skill, Richard T., 4,388,672, Cl. 361-412.000.
Mott, William E.; and Shakib, Iraj D., to International Business Machines Corporation. Font module for matrix printer. 4,388,010, Cl. 400-692.000.
Moyer, Wendell W.: *See*—
Toy, Lester T.; Moyer, Wendell W.; Lyons, Bernard J.; and Horsma, David A., 4,388,607, Cl. 338-22.0SD.
Mueller, Franz-Josef: *See*—
Hochstein, Waldheim; Kaibel, Gerd; Mueller, Franz-Josef; and Hartmann, Horst, 4,388,154, Cl. 203-35.000.
Mueller, Gerhard; and Puritscher, Ernst, to Siemens Aktiengesellschaft. Depositing device for a pre-folded continuous web of paper in a paper stacker. 4,388,072, Cl. 493-410.000.
Mueller, Gerhard H., to Siemens Aktiengesellschaft. Device for removing water from the solvent recovery system of a fast printer. 4,387,638, Cl. 101-1.000.
Mueller, Otto. Inter-axle transmission apparatus. 4,387,795, Cl. 192-60.000.
Mukai, Hideo: *See*—
Ueno, Tsuyoshi; Mukai, Hideo; Nakatomi, Yoshitsugu; Saito, Hiroshi; Kinoshita, Koichi; and Konuma, Takaaki, 4,387,980, Cl. 355-3.0CH.
Mukunoki, Yasuo; Nakayama, Yasuhiro; and Yokoyama, Shigeki, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material. 4,388,402, Cl. 430-527.000.
Mull, John D. Device for use in the collection and transportation of medical specimens. 4,387,725, Cl. 128-759.000.
Muller, Alfred: *See*—
Mohl, Helmut; Schab, Manfred; Sauer, Joseph; and Muller, Alfred, 4,387,608, Cl. 74-866.000.
Muller, Beat: *See*—
Kristinsson, Haukur; Muller, Beat; and Pachlatko, Johannes P., 4,388,464, Cl. 548-136.000.
Muller, Erhard: *See*—
Knackstedt, Hans-Gunther; Muller, Erhard; Christ, Richard; and Kroll, Hartmut, 4,388,268, Cl. 376-272.000.
Multistress, Inc.: *See*—
Keep, Henry, Jr.; Santagata, Daniel A.; Harris, Matthew E.; and Welsh, William H., Jr., 4,388,523, Cl. 219-541.000.
Mulzet, Alfred P.: *See*—
Kellogg, Robert M.; and Mulzet, Alfred P., 4,387,848, Cl. 494-81.000.
Mund, Konrad: *See*—
Richter, Gerhard; Weidlich, Erhard; and Mund, Konrad, 4,388,163, Cl. 204-101.000.
Munteanu, Marina A.: *See*—
Van Loveren, Augustinus G.; Munteanu, Marina A.; and Seaber, Geoffrey B., 4,387,849, Cl. 239-6.000.
Murai, Wasaburo; and Horikawa, Masao, to Terasaki Denki Sangyo Kabushiki Kaisha. Circuit interrupter. 4,388,506, Cl. 200-144.00R.
Murakami, Shinji, to Eiwa Chemical Industry Co., Ltd. Unsaturated polyester resin foams and method of preparation. 4,388,419, Cl. 521-103.000.
Murata, Eiji: *See*—
Aoyama, Shunichi; and Murata, Eiji, 4,387,673, Cl. 123-90.160.
Murata Kikai Kabushiki Kaisha: *See*—
Nakahara, Teiji; Morihashi, Toshifumi; Nakayama, Teruo; Nishimura, Shinichi; Kato, Hisaaki; Uematsu, Ikuzo; and Yoshioka, Takashi, 4,387,487, Cl. 19-249.000.
Murata Manufacturing Co., Ltd.: *See*—
Sakabe, Yukio; and Hamaji, Yukio, 4,388,416, Cl. 501-136.000.
Wakino, Kikuo; Kadota, Michio; and Sato, Tomoharu, 4,388,600, Cl. 333-151.000.
Murata, Shigeki: *See*—
Kajino, Jirou; Minabe, Hitoshi; and Murata, Shigeki, 4,388,658, Cl. 360-85.000.
Murayama, Hiroshi, to Nippon Steel Corporation. Method for the manufacture of steel suitable for electric-welded tubular products having superior resistance to sour gas. 4,388,123, Cl. 148-12.00F.
Murch, Charles J., Jr. Space heating stove. 4,387,699, Cl. 126-61.000.
Murphy, Daniel L.: *See*—
Kotok, Alan; Murphy, Daniel L.; and Stewart, Robert E., 4,388,685, Cl. 364-200.000.
Murphy, Harold K.: *See*—
Depew, Dean A.; and Murphy, Harold K., 4,387,636, Cl. 100-232.000.
Murphy, Jack P., deceased (by Murphy, James P., administrator); and Kimmell, Steven D., to Mattel, Inc. Solar tracking system. 4,387,702, Cl. 126-424.000.
Murphy, James P., administrator: *See*—
Murphy, Jack P., deceased; and Kimmell, Steven D., 4,387,702, Cl. 126-424.000.
Murphy, Thomas J.: *See*—
Dimond, Harold L.; and Murphy, Thomas J., 4,388,204, Cl. 252-98.000.
Murphy, William K.: *See*—
Rourke, John L.; Azar, Jack C.; and Murphy, William K., 4,388,274, Cl. 422-177.000.
Murray, Benjamin D.: *See*—
Stohler, Robert A.; and Murray, Benjamin D., 4,388,032, Cl. 414-95.000.
Murray, Edward D.: *See*—
Maurice, Terrence J.; Murray, Edward D.; and Agnes, Jennifer M., 4,388,333, Cl. 426-104.000.
Murray, James G., to Mobil Oil Corporation. Polyester resin blend. 4,388,440, Cl. 525-49.000.
Murrell's Welding Works, Inc.: *See*—
Brown, Billy G., 4,387,669, Cl. 122-235.00A.
Muschelknautz, Edgar: *See*—
Bueb, Michael; Bruck, Robert; Muschelknautz, Edgar; Paulini, Dieter; and Feltgen, Karlheinz, 4,387,476, Cl. 8-151.200.
Musgrave, Daniel D. Magazine engagement device. 4,387,525, Cl. 42-50.000.
Muthard, David A.: *See*—
Christensen, Burton G.; DiNinno, Frank P.; Muthard, David A.; and Ratcliffe, Ronald W., 4,388,310, Cl. 424-200.000.
Myers, Lawrence R., to Bendix Corporation, The. Tandem brake booster. 4,387,626, Cl. 91-376.00R.
Naarden International N.V.: *See*—
Wobben, Hendrik J.; and Tan, Hian-Bie, 4,388,330, Cl. 426-51.000.
Naffziger, David H., to Dow Chemical Company, The. Stable tocicant compositions of chlorpyrifos. 4,388,297, Cl. 424-78.000.
Nagai, Kunihiko: *See*—
Komatsu, Shigeru; Mizukami, Kazushi; Tachiuchi, Tsuguji; Nagai, Kunihiko; and Koyama, Takuo, 4,388,707, Cl. 365-230.000.
Nagano, Riichiro; and Kaneshige, Ryosuke, to Mitsui Petrochemical Industries, Ltd. Lubricating oil composition and process for preparation thereof. 4,388,202, Cl. 252-52.00A.
Nagano, Shuichi: *See*—
Sakamoto, Masakatsu; Uchida, Kenji; and Nagano, Shuichi, 4,387,595, Cl. 73-322.500.
Nagase, Masaomi: *See*—
Miyagi, Hideo; and Nagase, Masaomi, 4,387,682, Cl. 123-339.000.

Nagira, Norichika; Ikegami, Hiroshi; Baba, Hiroji; and Yahano, Kanji, to Nippon Steel Corporation. Apparatus for surface treatment of a steel strip. 4,388,169, Cl. 204-207.000.

Nagy, Frank A.: *See*—
McCarty, William H.; Guarino, John P.; and Nagy, Frank A., 4,388,137, Cl. 156-275.500.

Naiman, Michael I.; and Buriks, Rudolf S., to Petrolite Corporation. Olefin-acrylonitrile copolymers and uses thereof. 4,388,452, Cl. 526-342.000.

Naito, Masayoshi: *See*—
Watanabe, Atsuo; Naito, Masayoshi; Yatsuo, Tsutomu; and Okamura, Masahiro, 4,388,635, Cl. 357-38.000.

Nakagawa, Satoshi: *See*—
Kurita, Yukio; and Nakagawa, Satoshi, 4,387,546, Cl. 52-731.000.

Nakahara, Teiji; Morihashi, Toshifumi; Nakayama, Teruo; Nishimura, Shinichi; Kato, Hisaaki; Uematsu, Ikuzo; and Yoshioka, Takashi, to Murata Kikai Kabushiki Kaisha. High draft apparatus in spinning machine. 4,387,487, Cl. 19-249.000.

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Nakanishi, Takashi: *See*—
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Hirao, Shozo; Saihara, Yasuhiro; Nakanishi, Toshio; Ihara, Ichiro; and Sano, Yoshio, 4,388,133, Cl. 156-245.000.

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Koike, Norio; Sasano, Akira; Taniguchi, Yoshio; Nakano, Toshio; Aoki, Masakazu; and Takemoto, Iwao, 4,387,987, Cl. 355-133.000.

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Ueno, Tsuyoshi; Mukai, Hideo; Nakatomi, Yoshitsugu; Saito, Hiroshi; Kinoshita, Koichi; and Konuma, Takaaki, 4,387,980, Cl. 355-3.0CH.

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Nakahara, Teiji; Morihashi, Toshifumi; Nakayama, Teruo; Nishimura, Shinichi; Kato, Hisaaki; Uematsu, Ikuzo; and Yoshioka, Takashi, 4,387,487, Cl. 19-249.000.

Nakayama, Yasuhiro: *See*—
Mukunoki, Yasuo; Nakayama, Yasuhiro; and Yokoyama, Shigeki, 4,388,402, Cl. 430-527.000.

Nakazato, Yasuaki; Miyazaki, Yasushi; Osuga, Makoto; and Kodaira, Masao, to Shin-Etsu Chemical Co., Ltd. Apparatus for wet treatment of wafer materials. 4,388,140, Cl. 156-345.000.

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Yahrmarkt, Richard A.; and Stanbrough, Michael J., 4,388,148, Cl. 162-26.000.

Namiki Precision Jewel Co., Ltd.: *See*—
Nakatsuka, Hisayoshi, 4,388,486, Cl. 174-34.000.

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Shinozaki, Fumiaki; Namiki, Tomizo; and Ikeda, Tomoaki, 4,388,399, Cl. 430-271.000.

Nannini, Giuliano; Perrone, Ettore; Severino, Dino; Meinardi, Giuseppe; Monti, Gisella; Bianchi, Alberta; Forgione, Angelo; and Confalonieri, Carlo, to Farmitalia Carlo Erba S.p.A. Heteromonocyclic and heterobicyclic derivatives of unsaturated 7-acylamido-3-cephem-4-carboxylic acid. 4,388,314, Cl. 424-246.000.

Nash, Donald H.; and Yen, Duen H., to Bell Telephone Laboratories, Incorporated. Noise detector and data signal receiver for a frequency modulation system. 4,388,730, Cl. 455-208.000.

Nashua Corporation: *See*—
Cormier, Raymond G., 4,387,981, Cl. 355-3.0SH.

Natarajan, Cuddalore P.; and Meder, Siegfried R., to American Schack Company, Inc. Radiation shield and method of use. 4,388,066, Cl. 432-1.000.

Nathan, Roger H., to Advanced Products Beer-Sheva Ltd. Constant force generator mechanism and adjustable seat constructed therewith. 4,387,876, Cl. 248-571.000.

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Dom, Harry A., 4,387,502, Cl. 29-568.000.

National Patent Development Co.: *See*—
Chen, Richard, 4,388,436, Cl. 524-553.000.

National Patent Development Corporation: *See*—
Kuzma, Petr; and Odorisio, Giovanina, 4,388,428, Cl. 523-106.000.

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Balakrishnan, Ramanatha V., 4,388,699, Cl. 365-8.000.

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Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; and Stendel, Wilhelm, 4,388,322, Cl. 424-304.000.

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Baldwin, Dan D., 4,387,893, Cl. 272-118.000.

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Necas, Donald E.; and Khan, Aman U., to Whirlpool Corporation. Food processor. 4,387,860, Cl. 241-282.100.

Neff, Paul H.: *See*—
Brownlee, Robert R.; Hughes, Howard C., Jr.; Neff, Paul H.; and Tyers, G. Frank O., 4,387,717, Cl. 128-419.0PG.

Nekhamin, Sergei M.: *See*—
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.

Nelson, Erik K.: *See*—
Magin, Irving J.; and Nelson, Erik K., 4,387,985, Cl. 355-71.000.

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Khosropour, Mostafa M., 4,388,091, Cl. 55-337.000.

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Horiuchi, Michimasa; Ibamoto, Masahiko; and Nemoto, Kiyoshi, 4,388,573, Cl. 318-376.000.

NeoMed Corporation: *See*—
Ecanow, Charles S., 4,388,302, Cl. 424-150.000.

Neri, Paolo: *See*—
Cocola, Francesco; Tarli, Paolo; and Neri, Paolo, 4,388,295, Cl. 424-1.000.

Neves, Fernando: *See*—
Aichelmann, Frederick J., Jr.; and Neves, Fernando, 4,388,701, Cl. 365-77.000.

Neville, Dee J.: *See*—
Sarian, Grigor; and Neville, Dee J., 4,388,505, Cl. 200-83.00C.

New Mexico State University Foundation, Inc.: *See*—
Zartman, David L., 4,387,724, Cl. 128-736.000.

Newcomb, Kermit T., to Burlington Industries, Inc. Thread severing mechanism associated with shuttleless loom. 4,387,744, Cl. 139-429.000.

Ney, Ernst: *See*—
Zeidler, Guenter; Ney, Ernst; Lange, Gerhard; and Saller, Helmut, 4,388,485, Cl. 174-23.00C.

Nibby, Chester M., Jr.; and Johnson, Robert B., to Honeywell Information Systems Inc. Apparatus for deferring error detection of multibyte parity encoded data received from a plurality of input/output data sources. 4,388,684, Cl. 364-200.000.

Nicholson, Terence P. Gaskets. 4,387,904, Cl. 277-235.00B.

Nicolin, Curt, to Eminentverktyg A.B. Tool or workpiece chucking device. 4,387,906, Cl. 279-2.00A.

Nielsen, Niels J. O. Salt and/or gravel spreader. 4,387,855, Cl. 239-659.000.

Nikitushkin, Nikolai A.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.

Nimerick, Kenneth H.; and Copeland, Claude T., to Dow Chemical Company, The. Composition and method for melting frozen aqueous solutions. 4,388,203, Cl. 252-70.000.

Nippon Electric Co., Ltd.: *See*—
Ikeda, Hiroaki, 4,388,538, Cl. 307-482.000.
Kumagai, Ikuo; Koyanagi, Yukiaki; and Hidaka, Hiroshi, 4,388,009, Cl. 400-679.000.
Nakayama, Kenji, 4,388,693, Cl. 364-724.000.
Yamamoto, Setsuo; and Ushiyama, Yasuichi, 4,388,641, Cl. 358-51.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kato, Hirokazu; and Endo, Akinori, 4,387,617, Cl. 84-1.010.
Okamoto, Eisaku; and Mizuno, Kotaro, 4,387,620, Cl. 84-1.030.

Nippon Kokan Kabushiki Kaisha: *See*—
Akita, Shinji; and Hatanaka, Masayuki, 4,387,584, Cl. 72-100.000.

Nippon Oil Co., Ltd.: *See*—
Imai, Hirosuke; Matsuno, Mitsuo; and Kudoh, Michio, 4,388,480, Cl. 585-516.000.

Nippon Piston Ring Co., Ltd.: *See*—
Sakamaki, Hiroshi, 4,388,040, Cl. 415-174.000.

Nippon Soken, Inc.: *See*—
Iwamoto, Kenji; and Kuroyanagi, Makoto, 4,387,570, Cl. 60-600.000.
Kuno, Akira; Matsumoto, Muneaki; and Numata, Koji, 4,388,666, Cl. 361-149.000.

Nippon Steel Corporation: *See*—
Murayama, Hiroshi, 4,388,123, Cl. 148-12.00F.
Nagira, Norichika; Ikegami, Hiroshi; Baba, Hiroji; and Yahano, Kanji, 4,388,169, Cl. 204-207.000.
Nakashima, Hiroyuki; Sumida, Morihiro; and Goto, Hiroki, 4,388,112, Cl. 75-51.000.
Seki, Masahiko; Wada, Koji; and Io, Yukito, 4,387,884, Cl. 266-246.000.

Takao, Kengo; Ohmachi, Mineo; Kihara, Hisatsugu; Toki, Kenshiro; Tomita, Yukio; and Mizota, Toshihiro, 4,387,562, Cl. 60-39.150.
Takemura, Yozo; Kobayashi, Isao; Akita, Yasuhiro; and Kato, Kaoru, 4,388,113, Cl. 75-51.000.
Takeuchi, Osamu; Hasegawa, Hiroshi; Izumi, Susumu; and Otsuki, Naoki, 4,388,068, Cl. 432-122.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Kimura, Takao; and Yamanishi, Toru, 4,388,093, Cl. 65-3.110.
Takahashi, Shiro; Sanada, Kazuo; Inada, Koichi; and Fukuda, Osamu, 4,388,098, Cl. 65-157.000.
Nippondenso Co., Ltd.: *See*—
Mizuno, Tooru; and Hagisato, Yasuo, 4,388,558, Cl. 315-77.000.
Nishibayashi, Hatsumi; Amagai, Yoshimi; Hikake, Norio; Kouchi, Toshihiro; and Aizawa, Tatsuo, to Mita Industrial Company Limited. Electrophotographic process of developing and transfering images uses fluorine containing offset preventing agent in developer. 4,388,396, Cl. 430-126.000.
Nishikawa, Masaji: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,387,986, Cl. 355-75.000.
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, to Teijin Limited. Process for the preparation of active-type vitamin D_3 compounds. 4,388,243, Cl. 260-397.200.
Nishikawa, Syuzi; Matsubara, Toru; Iida, Kazuyoshi; and Tahara, Seiichiro, to Toyo Ink Manufacturing Co., Ltd. Heat-set type printing inks. 4,388,427, Cl. 523-500.000.
Nishikubo, Yasuhiko, to Citizen Watch Co., Ltd. Electronic timepiece. 4,388,001, Cl. 368-87.000.
Nishimura, Shinichi: *See*—
Nakahara, Teiji; Morihashi, Toshifumi; Nakayama, Teruo; Nishimura, Shinichi; Kato, Hisaaki; Uematsu, Ikuzo; and Yoshioka, Takashi, 4,387,487, Cl. 19-249.000.
Nishimura, Yuji: *See*—
Moriya, Shigeru; Yoshida, Akio; Tanaka, Koichi; and Nishimura, Yuji, 4,387,912, Cl. 280-804.000.
Nishioka, Kimihiko; and Yamasita, Nobuo, to Olympus Optical Co., Ltd. Single-lens reflex optical system for endoscopes. 4,387,969, Cl. 350-462.000.
Nissan Motor Co., Ltd.: *See*—
Aoyama, Shunichi; and Murata, Eiji, 4,387,673, Cl. 123-90.160.
Aoyama, Shunichi; and Murata, Eiji, 4,387,673, Cl. 123-90.160.
Ikeura, Kenji; and Morita, Tatsuo, 4,387,681, Cl. 123-325.000.
Katsumata, Masaaki; and Yoneda, Kenji, 4,387,571, Cl. 60-602.000.
Sakurada, Kenichi; Yoshida, Hiroyuki; and Ozaki, Tadahiko, 4,387,862, Cl. 242-107.600.
Yoshiba, Yasutaka; and Shiobara, Masaji, 4,387,694, Cl. 123-571.000.
Nisshin Oil Mills, Limited: *See*—
Seto, Akira; and Sakita, Takashi, 4,388,341, Cl. 426-656.000.
Noe, Oskar, to BWG Bergwerk- Und Walzwerk- Maschinenbau GmbH. Walking-beam conveyor. 4,387,800, Cl. 198-750.000.
Nola, Frank J., to United States of America, National Aeronautics and Space Administration. Electrical power generating system. 4,388,585, Cl. 322-47.000.
Nomura, Isshi: *See*—
Yogo, Kenji; and Nomura, Isshi, 4,387,696, Cl. 123-585.000.
Norden Laboratories, Inc.: *See*—
Kucera, Carrell J., 4,388,299, Cl. 424-92.000.
Noritake, Co., Limited: *See*—
Tetsuro, Oshimi, 4,387,538, Cl. 51-35.000.
North, Max R.: *See*—
Falendysz, Eugene L., Sr.; Brumbaugh, Eldon M.; and North, Max R., 4,388,052, Cl. 417-540.000.
Northern Telecom Limited: *See*—
Aminetzah, Yehuda J., 4,388,643, Cl. 358-123.000.
Northwestern University: *See*—
Gesteland, Robert C., 4,388,272, Cl. 422-102.000.
Numata, Koji: *See*—
Kuno, Akira; Matsumoto, Muneaki; and Numata, Koji, 4,388,666, Cl. 361-149.000.
Nuspl, Steven P., to Babcock & Wilcox Company, The. Velocity pressure averaging system. 4,388,691, Cl. 364-510.000.
Nyeki, Olga; Kisfaludy, Lajos; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar RT. Angiotensin-II analogues with antagonizing effects, containing an ester group in position 8, and a process for the preparation thereof. 4,388,304, Cl. 424-177.000.
Obata, Kazuo; Yamaguchi, Yutaka; Yamaguchi, Kojirou; and Sato, Akio, to Bridgestone Tire Company Limited. Pneumatic radial tire. 4,387,759, Cl. 152-353.00R.
Oblak, Pavel: *See*—
Plevnik, Stanislav; Vrtacnik, Peter; Malezic, Matija; Lukezic, Marino; Stanic, Uros; and Oblák, Pavel, 4,387,719, Cl. 128-421.000.
Obokata, Takeshi: *See*—
Shirasaki, Masataka; and Obokata, Takeshi, 4,387,953, Cl. 350-96.140.
O'Brien, John P. Slidable golf practice device. 4,387,896, Cl. 273-195.00A.
Occidental Chemical Agricultural Products, Inc.: *See*—
Lowder, Robert L., 4,388,101, Cl. 71-29.000.
Occidental Chemical Corporation: *See*—
Ilardo, Charles S.; and Scharf, Daniel J., 4,388,429, Cl. 524-94.000.
OCR Marketing Associates, Inc.: *See*—
Hayman, Richard W.; Goldstein, Burton; Lynn, Joe J.; Brown, Robert J.; and Bugash, Robert S., 4,388,689, Cl. 364-401.000.
Odorisio, Giovanina: *See*—
Kuzma, Petr; and Odorisio, Giovanina, 4,388,428, Cl. 523-106.000.
Ogawa, Akira: *See*—
Sugiyama, Masatoshi; Ogawa, Akira; and Imai, Shinichi, 4,388,115, Cl. 106-22.000.
Ogawa, Kazufumi; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, to Matsushita Electric Industrial Co., Ltd. Solid-state color-image sensor and process for fabricating the same. 4,388,128, Cl. 156-64.000.
Ogawa, Masaki; and Ikegami, Mikihiko, to Bridgestone Tire Company Limited. Pneumatic tires. 4,387,756, Cl. 152-209.00R.
Ogawa, Masaki; and Ikegami, Mikihiko, to Bridgestone Tire Company Limited. Pneumatic tires. 4,387,757, Cl. 152-209.00R.
Ogawa, Ryota: *See*—
Ohishi, Michiro; Ogawa, Ryota; and Arai, Yasunori, 4,387,979, Cl. 355-3.00R.
Ogden Industries Pty. Ltd.: *See*—
Dunphy, Gerald F.; and Esser, Hans J., 4,387,918, Cl. 292-224.000.
Ogura, Osamu: *See*—
Katagiri, Masayoshi; and Ogura, Osamu, 4,387,625, Cl. 91-369.00B.
Oguri, Yasuo; Awata, Mitsuru; and Abe, Mitsunobu, to Mitsubishi Chemical Industries Ltd. Process for preparing calcium silicate shaped product. 4,388,257, Cl. 264-82.000.
Ohio State University Research Foundation, The: *See*—
Shore, Sheldon G.; and Toft, Mark A., 4,388,284, Cl. 423-295.000.
Ohishi, Michiro; Ogawa, Ryota; and Arai, Yasunori, to Asahi Kogaku Kogyo Kabushiki Kaisha. Copying optical system. 4,387,979, Cl. 355-3.00R.
Ohmachi, Mineo: *See*—
Takao, Kengo; Ohmachi, Mineo; Kihara, Hisatsugu; Toki, Kenshiro; Tomita, Yukio; and Mizota, Toshihiro, 4,387,562, Cl. 60-39.150.
Ohmori, Takashi: *See*—
Moriguchi, Haruhiko; Kikuchi, Yoshiki; and Ohmori, Takashi, 4,388,628, Cl. 346-76.0PH.
Ohori, Hiroshi D. Adjustable support. 4,387,875, Cl. 248-480.000.
Ohshima, Kazushi: *See*—
Kudoh, Akihide; Kawamata, Motoo; Ohshima, Kazushi; Kotani, Makoto; Tsuda, Takeshi; and Aoki, Fukuichi, 4,388,478, Cl. 568-804.000.
Ohta, Yoshihiro; and Ichikawa, Akira, to Hitachi, Ltd. Speech pitch period extraction apparatus. 4,388,491, Cl. 179-1.0SC.
Oizumi, Masayuki; Abe, Masaharu; and Fushiki, Yasuo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Production of bubble-free electrical laminates. 4,388,129, Cl. 156-73.100.
Okabe, Yoshio: *See*—
Hori, Takanobu; Arai, Fuminao; Kodama, Hisashi; and Okabe, Yoshio, 4,387,675, Cl. 123-90.580.
Okamoto, Eisaku; and Mizuno, Kotaro, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic performing apparatus for musical performance data with main routine data and subroutine data. 4,387,620, Cl. 84-1.030.
Okamoto, Shozo, to Yonezawa Toys Co., Ltd. Toy car and roadbed unit. 4,388,036, Cl. 414-537.000.
Okamura, Masahiro: *See*—
Watanabe, Atsuo; Naito, Masayoshi; Yatsuo, Tsutomu; and Okamura, Masahiro, 4,388,635, Cl. 357-38.000.
Okamura, Shozo: *See*—
Okane, Koji; Okamura, Shozo; Sueyasu, Masanobu; Masuda, Seiichi; Tanaka, Tsutomu; and Tanaka, Koichi, 4,388,084, Cl. 48-197.00R.
Okane, Koji; Okamura, Shozo; Sueyasu, Masanobu; Masuda, Seiichi; Tanaka, Tsutomu; and Tanaka, Koichi, to Sumitomo Metal Industries, Ltd. Process for gasification of solid carbonaceous material. 4,388,084, Cl. 48-197.00R.
Okawara, Makoto: *See*—
Tsubuko, Kazuo; Hashimoto, Junichiro; Kuramoto, Shinichi; and Okawara, Makoto, 4,388,395, Cl. 430-114.000.
Okutu, Toshimitu: *See*—
Miyoshi, Takahito; Okutu, Toshimitu; Takimoto, Masaaki; Saida, Takashi; Akashi, Goro; and Fujiyama, Masaaki, 4,388,360, Cl. 428-172.000.
Olmann, Jurgen: *See*—
Schone, Peter; Olmann, Jurgen; and Lamparter, Helmut, 4,388,494, Cl. 179-1.00G.
Olofsson, Mats: *See*—
Buhler, Marcel; and Olofsson, Mats, 4,388,329, Cl. 426-40.000.
Olschewski, Armin: *See*—
Walter, Lothar; Olschewski, Armin; Kispert, Klaus; and Meining, Hans, 4,387,939, Cl. 308-217.000.
Olsen, Richard S.: *See*—
Gruzensky, William G.; and Olsen, Richard S., 4,388,280, Cl. 423-131.000.
Olson, Gary L.: *See*—
Berger, Leo; and Olson, Gary L., 4,388,467, Cl. 548-439.000.
Olympia Werke AG: *See*—
Wehking, Hans; Eichler, Detlef; and Klingenberg, Wolfgang, 4,388,005, Cl. 400-144.200.
Olympus Optical Company Ltd.: *See*—
Koshiishi, Kiyozo; Ono, Noriaki; Kamiyama, Takashi; and Kato, Yoshimi, 4,388,165, Cl. 204-418.000.
Nishioka, Kimihiko; and Yamasita, Nobuo, 4,387,969, Cl. 350-462.000.
Ono, Noriaki; and Kamiyama, Takashi, 4,388,167, Cl. 204-420.000.
Osanai, Akira, 4,388,660, Cl. 360-110.000.
Sakurai, Yoshifumi, 4,388,661, Cl. 360-112.000.

Sato, Masaaki, 4,388,492, Cl. 179-1.0GA.
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,387,986, Cl. 355-75.000.
Omark Industries, Inc.: *See*—
Inman, Darrel F., 4,387,492, Cl. 29-1.230.
Reynolds, Michael J., 4,387,753, Cl. 144-193.00D.
Omnichem S.A.: *See*—
Trouet, Andre B. L.; Hannart, Jean A. A. J.; and Rao, Kandukuri S. B., 4,388,305, Cl. 424-177.000.
Omron Tateisi Electronics Co.: *See*—
Fukuyama, Toshifumi; and Onji, Norio, 4,388,527, Cl. 250-214.00R.
Ona, Isao, to Toray Silicone Company, Ltd. Amino-functional silicone emulsions. 4,388,437, Cl. 524-588.000.
Onji, Norio: *See*—
Fukuyama, Toshifumi; and Onji, Norio, 4,388,527, Cl. 250-214.00R.
Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, to Sumitomo Chemical Company, Limited. Diphenylalkanoether and diphenylalkanone oximeether derivatives. 4,388,469, Cl. 549-59.000.
Ono, Noriaki; and Kamiyama, Takashi, to Olympus Optical Company Limited. Ion selective electrode. 4,388,167, Cl. 204-420.000.
Ono, Noriaki: *See*—
Koshiishi, Kiyozo; Ono, Noriaki; Kamiyama, Takashi; and Kato, Yoshimi, 4,388,165, Cl. 204-418.000.
Onodera, Kenji: *See*—
Mikoshiba, Hitoshi; Fujimori, Kazuyoshi; Onodera, Kenji; and Takeuchi, Shin, 4,387,643, Cl. 101-110.000.
Oppenlaender, Knut; Stork, Karl; and Barthold, Klaus, to BASF Aktiengesellschaft. Cyclic amidine based corrosion inhibitors which inhibit corrosion caused by CO_2 and H_2S. 4,388,213, Cl. 252-392.000.
Oppenlaender, Knut; Stork, Karl; and Barthold, Klaus, to BASF Aktiengesellschaft. Imidazoline based corrosion inhibitors which inhibit corrosion caused by CO_2 and H_2S. 4,388,214, Cl. 252-392.000.
Oras OY: *See*—
Saarisalo, Risto A.; and Koppanen, Jorma T., 4,387,880, Cl. 251-285.000.
Oreco III, Inc.: *See*—
Evans, Orde R., 4,388,025, Cl. 405-212.000.
Orlowski, Jan A., to Blendax-Werke R. Schneider GmbH & Co. Dental restorative material. 4,388,069, Cl. 433-228.000.
Orlowski, Ronald C.; and Seyler, Jay K., to Armour Pharmaceutical Company. Synthesis of peptides. 4,388,235, Cl. 260-112.50T.
Orzalesi, Giovanni, to Societa' Italo-Britannica L. Manetti-H. Roberts & C. L-Arginine D,L-pyroglutamate as a pharmaceutical agent having an activity at the neuro-endocrinal level. 4,388,325, Cl. 424-319.000.
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Putz, Johnny, 4,388,665, Cl. 361-119.000.
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Rosler, Kurt, 4,387,858, Cl. 241-152.00A.
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Knypl, Maria; Knypl, Eugeniusz; Starzak, Marian; Mieczkowska, Ewa; Pawlus, Urszula; Palubicki, Romuald; Ficek, Mieczyslaw; and Goldynia, Jozef, 4,388,438, Cl. 524-833.000.
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Ovalstrapping, Inc.: *See*—
Pasic, James A., 4,387,631, Cl. 100-32.000.
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Hall, Herbert L., Jr.; and Sheinkop, Isac M., 4,388,721, Cl. 373-31.000.
Owens-Illinois, Inc.: *See*—
Weckman, Richard L., 4,387,816, Cl. 215-1.00C.
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Morigaki, Masakazu; Yagihara, Morio; and Ozawa, Takashi, 4,388,404, Cl. 430-548.000.
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Tschan, J. Donald; and Hatton, Clifford P., 4,387,543, Cl. 52-295.000.
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Hogue, Norman E., 4,387,872, Cl. 248-221.300.
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Panicker, Narayana N.: *See*—
Gentry, Larry L.; Moss, Herbert H.; Panicker, Narayana N.; Wada, William T.; and Yancey, Irvin R., 4,388,022, Cl. 405-195.000.
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Matty, Thomas C.; Franz, James H., Jr.; and Parham, Carol D., 4,387,870, Cl. 246-122.00R.
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Carpenter, Larry L.; and Parham, Thomas G., 4,388,094, Cl. 65-3.120.
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Parker, Martin G. Turbocharger module for internal combustion engine. 4,387,573, Cl. 60-611.000.
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Lomneth, Richard B.; Blair, Daniel R.; Parnell, Gary L.; and Tao, Bernard Y., 4,388,339, Cl. 426-602.000.
Pasic, James A., to Ovalstrapping, Inc. Strap tensioning apparatus. 4,387,631, Cl. 100-32.000.
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von Hagel, Gunter; Berlenbach, Norbert; and Werner, Gerhard, 4,388,195, Cl. 210-709.000.
Patalidis, Claude A.: *See*—
Lucia, Carroll J., 4,388,196, Cl. 210-742.000.
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Jewell, Walter E. B.; and Patarcity, Adam J., 4,388,259, Cl. 264-153.000.
Patch, Richard J.; and Rose, George D., Jr., to General Electric Company. Memory device. 4,388,703, Cl. 365-105.000.
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Bueb, Michael; Bruck, Robert; Muschelknautz, Edgar; Paulini, Dieter; and Feltgen, Karlheinz, 4,387,476, Cl. 8-151.200.
Paulson, Jerome I.; and Hess, Larry W., to Hammertek Corporation. Short radius, low wear elbow. 4,387,914, Cl. 285-119.000.
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Pearson, Karen W.: *See*—
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Pecon, Joseph A., Jr., to Bell Telephone Laboratories, Incorporated. Submarine cable tension telemetering system. 4,388,710, Cl. 367-134.000.
Peelman, Harold E., to Halliburton Company. System for simultaneous measurement of borehole and formation neutron lifetimes. 4,388,529, Cl. 250-270.000.
Peeples, Denny L.: *See*—
Flory, Donald M.; and Peeples, Denny L., 4,387,569, Cl. 60-548.000.

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Pelrine, Bruce P.: *See*—
Bowes, Emmerson; and Pelrine, Bruce P., 4,388,177, Cl. 208-111.000.

Pelts, Boris B.: *See*—
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.

Penland, William D.; and Loew, Harold F., to Square D Company. Multiple position pushbutton switch. 4,388,503, Cl. 200-5.00R.

Perkin-Elmer Corporation, The: *See*—
Hansel, Allen B., 4,388,732, Cl. 455-608.000.
Loveland, Robert S., 4,388,694, Cl. 364-834.000.

Perkins, Patrick D.: *See*—
Chang, Clarence D.; and Perkins, Patrick D., 4,388,461, Cl. 546-251.000.

Permacel: *See*—
Eskay, Robert R., 4,388,432, Cl. 524-388.000.
Korpman, Ralf; and Felice, C. Palermo, 4,388,349, Cl. 427-208.400.

Perrone, Ettore: *See*—
Nannini, Giuliano; Perrone, Ettore; Severino, Dino; Meinardi, Giuseppe; Monti, Gisella; Bianchi, Alberta; Forgione, Angelo; and Confalonieri, Carlo, 4,388,314, Cl. 424-246.000.

Person, Lucien, to Produits Chimiques Ugine Kuhlmann. Process for extraction of iodine. 4,388,231, Cl. 252-631.000.

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Mathews, James K., 4,388,515, Cl. 219-110.000.

Petersen, Joachim: *See*—
Gerke, Peter; and Petersen, Joachim, 4,388,718, Cl. 370-110.100.

Petersson, Stig A.: *See*—
Jensfelt, Torsten E.; and Petersson, Stig A., 4,388,110, Cl. 75-21.000.

Petrolite Corporation: *See*—
Naiman, Michael I.; and Buriks, Rudolf S., 4,388,452, Cl. 526-342.000.

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Petrov, Stanislav V.: *See*—
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.

Pettit, George R., to University Patents, Inc. Phyllanthostatin compounds. 4,388,457, Cl. 536-4.100.

Pezzillo, William A.; and Crickmer, Charles C., to United States of America, Air Force. Automatically sequenced signaling system. 4,388,614, Cl. 340-384.00E.

Phillips Petroleum Company: *See*—
Burns, Lyle D., 4,388,081, Cl. 44-78.000.
Irvin, Howard B., 4,388,444, Cl. 525-92.000.
Solomon, Paul W., 4,388,225, Cl. 252-463.000.

Phy, William S., to Fairchild Camera & Instrument Corp. Precision optical spacers for image sensor filters. 4,388,525, Cl. 250-211.00J.

Piccardi, Paolo: *See*—
Massardo, Pietro; Longoni, Angelo; and Piccardi, Paolo, 4,388,323, Cl. 424-305.000.

Pichaichanarong, Puvin: *See*—
United States of America, National Aeronautics and Space Administration; Corcoran, William H.; Fong, William S.; Pichaichanarong, Puvin; Chan, Paul C. F.; and Lawson, Daniel D., 4,388,171, Cl. 208-8.0LE.

Piepers, Harry C., to Galenstan AG. Method of applying coverings in the form of completely or not completely closed loops. 4,388,157, Cl. 204-15.000.

Pigerol, Charles: *See*—
de Cointet de Fillain, Paul; and Pigerol, Charles, 4,388,430, Cl. 524-99.000.

Pigeroulet, Jean: *See*—
Leblanc, Jean; Pigeroulet, Jean; Straubel, Max; and Eckert, Konrad, 4,387,686, Cl. 123-446.000.

Pillsbury Company, The: *See*—
Yong, Samuel H.; Anderson, George R.; and Levin, Liza, 4,388,336, Cl. 426-551.000.

Pinto, Akiva: *See*—
Keller, Alex J.; Williams, Joseph R.; Fechner, Erhard A.; and Pinto, Akiva, 4,387,486, Cl. 19-105.000.

Piper, Alfred E. C.: *See*—
Blackburn, Neil P.; Piper, Alfred E. C.; and Meeks, Alan M. G., 4,387,490, Cl. 24-200.000.

Pipes, George R., to Eaton Corporation. Shuttle assembly. 4,388,033, Cl. 414-282.000.

Pirich, Andrew R., to United States of America, Air Force. Coherent optical feature identifier apparatus. 4,387,989, Cl. 356-71.000.

Pisani, Marino J., to Dresser Industries, Inc. Sideboom crawler suspension. 4,387,779, Cl. 180-9.500.

Pisiotas, Georg: *See*—
Fory, Werner; Martin, Henry; and Pisiotas, Georg, 4,388,106, Cl. 71-105.000.

Pithouse, Kenneth B.: *See*—
Bonnet, Jean-Claude; and Pithouse, Kenneth B., 4,388,449, Cl. 525-477.000.

Pitzele, Barnett S.: *See*—
Hamilton, Robert W.; Henderson, Richard E. L.; and Pitzele, Barnett S., 4,388,308, Cl. 424-180.000.

Pizzi, Domenico. Storable table. 4,387,650, Cl. 108-40.000.

Pizzuti, Donato F., to Polaroid Corporation. Folding camera with pivotally mounted viewfinder. 4,387,978, Cl. 354-187.000.

Plevnik, Stanislav; Vrtacnik, Peter; Malezic, Matija; Lukezic, Marino; Stanic, Uros; and Oblak, Pavel, to Gorenje Tovarna Gospodinjske Opreme N.Sol.O. Velenje. Control circuit of a therapeutic stimulator for the urinary incontinence. 4,387,719, Cl. 128-421.000.

PLM Aktiebolag: *See*—
Jacobsen, Kjell M., 4,387,815, Cl. 215-1.00C.

Pneu Uniroyal Englebert: *See*—
Mirtain, Henri J.; and Zinnen, Norbert, 4,387,754, Cl. 152-209.00R.

Poeppelmeier, Kenneth R.; and Longo, John M., to Exxon Research and Engineering Co. Oxygen deficient manganese perovskites. 4,388,294, Cl. 423-599.000.

Poinson, Regis: *See*—
Dupin, Thierry; Bouge, Gilbert; and Poinson, Regis, 4,388,288, Cl. 423-416.000.

Polaroid Corporation: *See*—
Borror, Alan L.; and Ellis, Ernest W., 4,388,398, Cl. 430-212.000.
Pizzuti, Donato F., 4,387,978, Cl. 354-187.000.

Polikoff, Lawrence A. Eye treatment device and method. 4,387,707, Cl. 128-25.00A.

Pollak, Alfred: *See*—
Goseberg, Walter; Pollak, Alfred; and Reichow, Wolfgang, 4,388,568, Cl. 315-411.000.

Polsfuss, Marvin F. Plastic cork lifter. 4,387,609, Cl. 81-3.360.

Pont-A-Mousson S.A.: *See*—
Maublanc, Georges, 4,387,482, Cl. 16-64.000.

Poole, Lee H. Solar heating device. 4,387,703, Cl. 126-429.000.

Poole, Michael M.; Solitt, Samuel G.; and Shaw, Jerry. Gem storage, display and inventory control system. 4,387,806, Cl. 206-232.000.

Popeney, Harry V. Vehicle with improved luggage and rack assembly. 4,387,840, Cl. 224-314.000.

Popov, Alexandr N.: *See*—
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.

Porter, Vernon R.: *See*—
Schulte, Eric F.; and Porter, Vernon R., 4,388,517, Cl. 219-121.0LJ.

Poruczník, Paul: *See*—
Franek, Josef T.; Poruczník, Paul; and Styles, Alan E., 4,387,747, Cl. 141-1.000.

Posso, Patrick P., to Gefitec S.A. Video cassette. 4,387,864, Cl. 242-199.000.

Post, Larry K.: *See*—
Culbertson, Billy M.; Post, Larry K.; and Aulabaugh, Ann E., 4,388,451, Cl. 526-271.000.

Powell, James E.; and Barker, Michael D., to Shell Oil Company. 3-Phenylmethoxytetrahydropyran herbicides. 4,388,104, Cl. 71-88.000.

PPG Industries, Inc.: *See*—
Richter, Sidney B.; and Van Gemert, Barry, 4,388,473, Cl. 560-65.000.

Prameta Prazisionsmetaal-und Kunstofferzeugnisse G. Baumann & Co.: *See*—
Dudek, Gunter, 4,387,489, Cl. 24-133.000.

Prato, Luigi, to Fiat Auto S.p.A. Motor vehicle door. 4,387,536, Cl. 49-502.000.

Pratt, Roy E.; Sayles, Scott M.; Bowers, Kerry W.; and Scott, Richard P., deceased (by Scott, Candice C., executrix), to Texaco Inc. Hydrocarbon conversion process. 4,388,176, Cl. 208-80.000.

Preiss, Gunther W. B., to Trevex Corporation. Conductivity dependent pump and process control. 4,388,043, Cl. 417-36.000.

Prescolite, A Div. of U.S. Industries: *See*—
Druffel, James B., 4,388,677, Cl. 362-276.000.

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Miller, Ross, 4,387,530, Cl. 46-1.00L.

Procter & Gamble Company, The: *See*—
Dornbusch, Arthur H., 4,387,808, Cl. 206-432.000.
Lee, Franky B.; and Jobes, Orin, Jr., 4,388,056, Cl. 425-83.100.
Lomneth, Richard B.; Blair, Daniel R.; Parnell, Gary L.; and Tao, Bernard Y., 4,388,339, Cl. 426-602.000.

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Person, Lucien, 4,388,231, Cl. 252-631.000.

Produits Menagers Coronet (1980) Inc.: *See*—
Parent, Daniel, 4,387,825, Cl. 220-234.000.

Prolygin, Anatoly P.: *See*—
Shipaev, Gennady A.; Seliverstov, Vyacheslav V.; Osipov, Nikolai A.; Prolygin, Anatoly P.; Mashikhin, Anatoly D.; Askinazi,

Mikhail P.; Andreev, Jury M.; and Kagan, Samuil I., 4,388,569, Cl. 318-87.000.
Prunty, John, to General Dynamics Corp./Convair Division. Controlled elastomeric tooling for plastic fabrication. 4,388,263, Cl. 264-257.000.
Public Safety Equipment Company: *See*—
Menke, W. Kenneth, 4,388,609, Cl. 340-84.000.
Pulchinski, Steven J.: *See*—
Lostumo, Arthur J.; and Pulchinski, Steven J., 4,387,947, Cl. 339-90.00R.
Purdue Research Foundation: *See*—
Geddes, Leslie A.; Bourland, Joe D.; and Pearce, John A., 4,387,714, Cl. 128-303.130.
Purdum, William R., to Monsanto Company. Alkylphosphonate diesters of N-phosphonomethylglycinate as herbicides. 4,388,102, Cl. 71-86.000.
Purdum, William R., to Monsanto Company. Alkylphosphonate monoesters of N-phosphonomethylglycinate as herbicides. 4,388,103, Cl. 71-86.000.
Puritan-Bennett Corp.: *See*—
Sarian, Grigor; and Neville, Dee J., 4,388,505, Cl. 200-83.00C.
Puritscher, Ernst: *See*—
Mueller, Gerhard; and Puritscher, Ernst, 4,388,072, Cl. 493-410.000.
Putz, Johnny, to Oskar Woertz, Inhaber Hans Woertz. Apparatus for reducing electrical fault voltages in electrical conductors. 4,388,665, Cl. 361-119.000.
Putzrath, Franz L.: *See*—
Hedlund, Lee V.; Herzog, Donald G.; and Putzrath, Franz L., 4,388,657, Cl. 360-72.100.
Quaintance, Dennis W.: *See*—
Quaintance, Laythol W.; and Quaintance, Dennis W., 4,387,919, Cl. 292-296.000.
Quaintance, Laythol W.; and Quaintance, Dennis W. Portable auxiliary door lock. 4,387,919, Cl. 292-296.000.
Quaker Oats Company, The: *See*—
Maher, William M., 4,387,604, Cl. 74-354.000.
Quick, Michael H., to UOP Inc. Recovery of metal values from organic reaction products. 4,388,279, Cl. 423-22.000.
Racal Research Limited: *See*—
Brennan, Martin J., 4,387,963, Cl. 350-331.00T.
Radakova, Tatyana N.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.
Rademacher, Friedrich, to Holstein und Kappert GmbH. Method and device for transmitting crown corks. 4,387,797, Cl. 198-461.000.
Radiochemical Centre Limited, The: *See*—
Monks, Reginald, 4,388,241, Cl. 260-397.100.
Ragir, Meyer J.; and Mayer, Joseph B., to Selfix, Inc. Shower shelf. 4,387,811, Cl. 211-119.000.
Rainis, Andrew, to Chevron Research Company. Method for beneficiation of phosphate rock. 4,388,180, Cl. 209-5.000.
Rainis, Andrew; and Detz, Clifford M., to Chevron Research Company. Method for the production of metallurgical grade coal and low ash coal. 4,388,181, Cl. 209-12.000.
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de Figueiredo, Mario P.; Guevara, Balagtas F.; Long, James L.; Morgan, Ronnie G.; and York, Lawrence R., 4,388,340, Cl. 426-614.000.
Ramirez, Antonio. Magnetic device for controlling starting of a single phase induction motor. 4,388,580, Cl. 318-787.000.
Rammer, William L.: *See*—
Sweeney, Raymond G.; and Rammer, William L., 4,387,799, Cl. 198-735.000.
Rankel, Lillian A.; and Valyocsik, Ernest W., to Mobil Oil Corporation. Process for the preparation of ZSM-5 utilizing transition metal complexes during crystallization. 4,388,285, Cl. 423-329.000.
Rao, G. R. Mohan, to Texas Instruments Incorporated. Reduced field implant for dynamic memory cell array. 4,388,121, Cl. 148-1.500.
Rao, Kandukuri S. B.: *See*—
Trouet, Andre B. L.; Hannart, Jean A. A. J.; and Rao, Kandukuri S. B., 4,388,305, Cl. 424-177.000.
Rao, Nidamboor V., to U.S. Philips Corporation. Low noise electron gun. 4,388,556, Cl. 315-14.000.
Ratcliffe, Ronald W.: *See*—
Christensen, Burton G.; DiNinno, Frank P.; Muthard, David A.; and Ratcliffe, Ronald W., 4,388,310, Cl. 424-200.000.
Rauh, R. David; and Boudreau, Robert A., to EIC Laboratories, Inc. Photoelectrochemical cell. 4,388,384, Cl. 429-111.000.
Ray, Francis M., to Zenith Radio Corporation. Quick-heating cathode structure. 4,388,551, Cl. 313-346.00R.
Raychem Corporation: *See*—
Toy, Lester T.; Moyer, Wendell W.; Lyons, Bernard J.; and Horsma, David A., 4,388,607, Cl. 338-22.0SD.
Raychem Limited: *See*—
Bonnet, Jean-Claude; and Pithouse, Kenneth B., 4,388,449, Cl. 525-477.000.
Raytheon Company: *See*—
Eldridge, David P., 4,388,682, Cl. 364-200.000.
Salzer, Thomas E.; and Saxelby, John R., Jr., 4,388,512, Cl. 219-56.220.
RCA Corporation: *See*—
Amantea, Robert; and Wheatley, Carl F., Jr., 4,388,634, Cl. 357-34.000.
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Chen, Hsing-Yao, 4,388,553, Cl. 313-414.000.
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Chou, Eng J.; and Weinstein, Bruce, 4,388,282, Cl. 423-242.000.
Sapp, Dennis H., 4,387,628, Cl. 98-58.000.
Resonant Technology Co.: *See*—
Gurries, Raymond A., 4,387,859, Cl. 241-262.000.
Reti, Aldo M.: *See*—
Stavish, Michael F.; and Reti, Aldo M., 4,388,270, Cl. 420-473.000.
Reuter, Wolfgang: *See*—
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Wigan, Jack G.; Ure, David G.; and Richards, John M., 4,388,489, Cl. 178-3.000.

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Kibby, Robert M., 4,388,107, Cl. 75-10.00R.

Reynolds, Michael J., to Omark Industries, Inc. Splitting device with varying cross sections. 4,387,753, Cl. 144-193.00D.

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Uhlmann, Georg, 4,387,716, Cl. 128-352.000.

Rhodes, Roland N., to RCA Corporation. Color filter having vertical color stripes with a nonintegral relationship to CCD photosensors. 4,388,640, Cl. 358-44.000.

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Bahr, James T., 4,388,105, Cl. 71-91.000.

Rhone Poulenc Inc.: *See*—
Farber, Leon; and Gradeff, Peter S., 4,388,250, Cl. 260-465.00F.

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Derrien, Jean-Yves; and Belon, Paul, 4,388,226, Cl. 252-470.000.
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Wigan, Jack G.; Ure, David G.; and Richards, John M., 4,388,489, Cl. 178-3.000.

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Richardson, William E., to Sprague Electric Company. Signal limiting integrated circuit. 4,388,632, Cl. 357-15.000.

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Nyeki, Olga; Kisfaludy, Lajos; Karpati, Egon; and Szporny, Laszlo, 4,388,304, Cl. 424-177.000.

Richter, Gerhard; Weidlich, Erhard; and Mund, Konrad, to Siemens Aktiengesellschaft. Method for the indirect oxidation of urea. 4,388,163, Cl. 204-101.000.

Richter, John W., to Du Pont de Nemours, E. I., and Company. Reducing surface tension with N-type betaines of 2-hydroxyl-1,1,2,3,3-pentahydroperfluoroalkylamines. 4,388,212, Cl. 252-356.000.

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Egee, Walter W.; and Rickansrud, David A., 4,388,332, Cl. 426-88.000.

Ricoh Company, Ltd.: *See*—
Araki, Kunihiko, 4,387,975, Cl. 354-25.000.
Iwata, Susumu; Maruta, Keiichi; and Yuyama, Yukihiro, 4,388,362, Cl. 428-211.000.
Sakai, Kiyoshi, 4,388,393, Cl. 430-59.000.
Tsubuko, Kazuo; Hashimoto, Junichiro; Kuramoto, Shinichi; and Okawara, Makoto, 4,388,395, Cl. 430-114.000.
Umezawa, Michio, 4,388,627, Cl. 346-75.000.

Rieder, Werner; and Fehrle, Martin, to Isovolta Osterreichische Isolierstoffwerke. Polyester. 4,388,454, Cl. 528-176.000.

Rieppel, Perry J.: *See*—
Coughlin, William J.; Hoffman, Stephen A.; and Rieppel, Perry J., 4,388,514, Cl. 219-69.00R.

Rigazio, Anthony W.; Mathieson, Donald E.; and Hawkinson, Paul E., to Spartus Corporation. Connector for arrangement for a-c. clock mechanism. 4,388,002, Cl. 368-88.000.

Rinderle, James R., to Massachusetts Institute of Technology. Controllable heat transfer device. 4,387,762, Cl. 165-1.000.

Ringwald, Erwin, to Sandoz Ltd. 3-Aminopropoxyaryl derivative in the treatment of tremor. 4,388,320, Cl. 424-274.000.

Ripert, Roger L., to Grove Valve and Regulator Company. Line removable valve structure with extensible seal rings on pipeline support structure. 4,387,735, Cl. 137-315.000.

Ritsema, Irving R., to Bendix Corporation, The. Parking brake for front wheel drive vehicle including brake band for universal joint. 4,387,791, Cl. 188-77.00R.

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Rividi, Jan, to Elam Limited. Control circuit for a discharge lamp. 4,388,565, Cl. 315-291.000.

Rix, Robert D., to AMP Incorporated. Palm grip apparatus for insertion of wires. 4,387,501, Cl. 29-566.400.

Roach, Maurice P.; Burkhart, Russell D.; and Meehan, James B., to Iowa Engineered Processes Corp. Deburring and cleaning machine and process. 4,387,537, Cl. 51-17.000.

Robach, Michael C.; and Thompson, Quentin E., to Monsanto Company. Method for inhibiting growth of food poisoning organisms. 4,388,321, Cl. 424-279.000.

Roberge, Pierre: *See*—
Kimmerle, Frank M.; and Roberge, Pierre, 4,388,149, Cl. 162-153.000.

Robert Bosch GmbH: *See*—
Eheim, Franz, 4,387,683, Cl. 123-387.000.
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Hoppel, Rainer, 4,387,687, Cl. 123-493.000.
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Leblanc, Jean; Pigeroulet, Jean; Straubel, Max; and Eckert, Konrad, 4,387,686, Cl. 123-446.000.
Leiber, Heinz, 4,387,782, Cl. 180-132.000.
Lungu, Corneliu, 4,388,575, Cl. 318-475.000.
Mohl, Helmut; Schab, Manfred; Sauer, Joseph; and Muller, Alfred, 4,387,608, Cl. 74-866.000.

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Robin, Roger; and Ap, Ngy S., to Valeo. Cooling systems for internal combustion engine comprising a radiator equipped with an expansion-tank. 4,387,670, Cl. 123-41.080.

Robinson, Morton: *See*—
Turk, Roger R.; and Robinson, Morton, 4,388,097, Cl. 65-64.000.

Robinson, Stuart A., to Robinson Thread Company. Ornamental thread and method of forming same. 4,387,555, Cl. 57-235.000.

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Robinson, William P.; McNulty, Hugh, Jr.; Seliger, Robert L.; and Williamson, Weldon S., to Hughes Aircraft Company. Filament dispenser cathode. 4,388,560, Cl. 315-111.810.

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Tyer, Robert C., 4,387,752, Cl. 144-34.00E.

Rockwell International Corporation: *See*—
Borugian, Dennis A., 4,387,789, Cl. 188-1.110.
Cline, Charles D., 4,387,956, Cl. 350-96.200.
Gal, Laszlo V., 4,388,700, Cl. 365-11.000.
Holly, Sandor, 4,387,966, Cl. 350-360.000.
McClure, Don W., 4,387,494, Cl. 29-159.00A.
Van Eerden, Richard L.; Vial, Norman D., Jr.; and Slane, Irvin L., 4,387,926, Cl. 297-375.000.
Wong, Jon H., 4,387,511, Cl. 33-1.0BB.

Rod, Robert L.: *See*—
Basol, Bulent M.; Tseng, Eric S.; and Rod, Robert L., 4,388,483, Cl. 136-260.000.

Rodewald, Bernhard; Tippmer, Kurt; and Tamm, Hans F., to Ruhrkohle Aktiengesellschaft. Liquefaction of coal. 4,388,172, Cl. 208-10.000.

Rodgers, Earl T. Blind fastener device. 4,388,031, Cl. 411-43.000.

Rodriguez, David A.: *See*—
Grove, Charles F.; and Rodriguez, David A., 4,387,971, Cl. 350-500.000.

Rogier, Edgar R., to Henkel Corporation. Polyglycidyl ethers. 4,388,209, Cl. 252-182.000.

Rohm GmbH: *See*—
Kraemer, Dieter; Lehmann, Klaus; and Hartl, Roland, 4,388,271, Cl. 422-56.000.

Rohm and Haas Company: *See*—
Swift, Graham; Cenci, Harry J.; and Jenkins, Raymond F., 4,388,434, Cl. 524-476.000.

Romano, Domenic R.: *See*—
Hall, Roger L.; and Romano, Domenic R., 4,388,671, Cl. 361-383.000.

Romblom, Edward R., to General Motors Corporation. Exhaust gas recirculation control. 4,387,693, Cl. 123-569.000.

Rosato, Dennis W.; and Lister, Neil K. Insulation board. 4,388,366, Cl. 428-285.000.

Rose, George D., Jr.: *See*—
Patch, Richard J.; and Rose, George D., Jr., 4,388,703, Cl. 365-105.000.

Rosenfeldt, Wolfgang, to Sybron Corporation. Constant speed regulator for DC motors. 4,388,572, Cl. 318-317.000.

Rossler, Kurt, to Osnabrucker Metallwerke J. Kampschulte GmbH & Co. KG. Machine for the comminuting of bulk material. 4,387,858, Cl. 241-152.00A.

Roth, Adrian W.; and Morva, Tibor, to Sprecher & Schuh AG. Excess-current protective switch. 4,388,507, Cl. 200-148.00R.

Rourke, John L.; Azar, Jack C.; and Murphy, William K., to Xerox Corporation. Ozone collection and filtration system. 4,388,274, Cl. 422-177.000.

Routson, Edwin J. Portable concrete mixing and transport apparatus. 4,387,995, Cl. 366-2.000.

Rowe, Frederick, to Imperial Chemical Industries PLC. Regeneration of cracking catalyst in two successive zones. 4,388,218, Cl. 252-417.000.

Rozanova, Alla V.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.

Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G. Method and apparatus for smelting charge materials in electric arc furnace. 4,388,108, Cl. 75-10.00R.

Rozmus, Walter J.: *See*—
Rozmus, Walter J., Jr.; and Rozmus, Walter J., 4,388,088, Cl. 55-101.000.

Rozmus, Walter J., Jr.; and Rozmus, Walter J., to Kelsey-Hayes Company. Vacuum chamber assembly for degassing particulate material. 4,388,088, Cl. 55-101.000.

Ruck, Jules B., to W. E. Greer Ltd. Composition for washing fabric. 4,388,077, Cl. 8-138.000.

Ruemer, John, Jr., to Crown Cork & Seal Company, Incorporated. Container closure. 4,387,827, Cl. 220-269.000.

Ruhrkohle Aktiengesellschaft: *See*—
Rodewald, Bernhard; Tippner, Kurt; and Tamm, Hans F., 4,388,172, Cl. 208-10.000.

Rule, Ian R.: *See*—
Shepherd, Gary D.; Fernandez, Ramon B.; and Rule, Ian R., 4,388,289, Cl. 423-447.400.

Rush, Derek A.; and Swadling, Roger D., to Smiths Industries Public Limited Company. Optical displacement transducers. 4,388,613, Cl. 340-347.00P.

Ryazantsev, Leonid A.: *See*—
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.

Ryder, Francis E.: *See*—
Thomas, Michael D.; and Ryder, Francis E., 4,388,521, Cl. 219-521.000.

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Saar, David A.; Walter, Richard T.; and Bowman, John L., Jr., to Black & Decker Inc. Apparatus and method for charging batteries. 4,388,582, Cl. 320-20.000.

Saarisalo, Risto A.; and Koppanen, Jorma T., to Oras OY. Single-grip mixing valve. 4,387,880, Cl. 251-285.000.

Saida, Takashi: *See*—
Miyoshi, Takahito; Okutu, Toshimitu; Takimoto, Masaaki; Saida, Takashi; Akashi, Goro; and Fujiyama, Masaaki, 4,388,360, Cl. 428-172.000.

Saihara, Yasuhiro: *See*—
Hirao, Shozo; Saihara, Yasuhiro; Nakanishi, Toshio; Ihara, Ichiro; and Sano, Yoshio, 4,388,133, Cl. 156-245.000.

St. Joe Minerals Corporation: *See*—
Parker, G. Anthony, 4,388,210, Cl. 252-182.100.

St. John, Michael R.: *See*—
Sammells, Anthony F.; and St. John, Michael R., 4,388,162, Cl. 204-78.000.

Saito, Hiroshi: *See*—
Ueno, Tsuyoshi; Mukai, Hideo; Nakatomi, Yoshitsugu; Saito, Hiroshi; Kinoshita, Koichi; and Konuma, Takaaki, 4,387,980, Cl. 355-3.0CH.

Saito, Seiichi; and Kitano, Yuji, to A. Aoki & Associates. Bus transmission system. 4,388,725, Cl. 375-36.000.

Sakabe, Yukio; and Hamaji, Yukio, to Murata Manufacturing Co., Ltd. Ceramic dielectric compositions for temperature compensating capacitors. 4,388,416, Cl. 501-136.000.

Sakai, Kiyoshi, to Ricoh Co., Ltd. Hydrazone compound, with hydroxyethyl group in charge transfer layer. 4,388,393, Cl. 430-59.000.

Sakakibara, Shiro, to Aisin Warner Kabushiki Kaisha. Overdrive unit in automatic transmissions. 4,387,607, Cl. 74-781.00R.

Sakamaki, Hiroshi, to Nippon Piston Ring Co., Ltd. Rotary fluid pump. 4,388,040, Cl. 415-174.000.

Sakamoto, Masakatsu; Uchida, Kenji; and Nagano, Shuichi, to Hitachi, Ltd. Float of slurry pressure feeding system. 4,387,595, Cl. 73-322.500.

Sakata, Hiromi: *See*—
Koyama, Shigeo; Yamagata, Ryutaro; Kozuka, Nobuhiko; and Sakata, Hiromi, 4,387,889, Cl. 271-10.000.

Sakita, Takashi: *See*—
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Sakurada, Kenichi; Yoshida, Hiroyuki; and Ozaki, Tadahiko, to Nissan Motor Company, Limited. Seat belt retractor. 4,387,862, Cl. 242-107.600.

Sakurai, Yoshifumi, to Olympus Optical Co., Ltd. Multichannel magnetic head and a manufacturing method therefor. 4,388,661, Cl. 360-112.000.

Salem, Eli: *See*—
Down, Peter E.; and Salem, Eli, 4,388,417, Cl. 521-26.000.

Saller, Helmut: *See*—
Zeidler, Guenter; Lange, Gerhard; and Saller, Helmut, 4,387,958, Cl. 350-96.230.
Zeidler, Guenter; Ney, Ernst; Lange, Gerhard; and Saller, Helmut, 4,388,485, Cl. 174-23.00C.

Salzer, Thomas E.; and Saxelby, John R., Jr., to Raytheon Company. Aluminum wire ball bonding apparatus and method. 4,388,512, Cl. 219-56.220.

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Blaschke, Felix; and Salzmann, Theodor, 4,388,577, Cl. 318-717.000.

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Samodovitz, Arthur. Multiple field acoustic focusser. 4,387,599, Cl. 73-642.000.

Sanada, Kazuo: *See*—
Takahashi, Shiro; Sanada, Kazuo; Inada, Koichi; and Fukuda, Osamu, 4,388,098, Cl. 65-157.000.

Sander, Wolfgang; and Jung, Ernst-Gunter, to Jung GmbH. Microwave heating apparatus for circulable media. 4,388,511, Cl. 219-10.55R.

Sanders, James M.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,388,207, Cl. 252-174.110.

Sanders, Kenneth H., to Milliken Research Corportion. Heat set warp knit weft inserted fabric and coating thereof. 4,388,364, Cl. 428-253.000.

Sandoz Ltd.: *See*—
Cavanak, Thomas, 4,388,307, Cl. 424-177.000.
Mauric, Claudine; and Wolf, Rainer, 4,388,431, Cl. 524-119.000.
Ringwald, Erwin, 4,388,320, Cl. 424-274.000.
Stettler, Hans; Buser, Karl; and Chavannes, Jean-Pierre, 4,388,205, Cl. 252-135.000.

Sandstrom, Richard D., to Medtronic, Inc. Coaxial service kit. 4,387,727, Cl. 128-784.000.

Sangamo Weston Limited: *See*—
Metcalf, Eric, 4,388,727, Cl. 375-88.000.

Sangree, Neal V., to Babcock & Wilcox Company, The. Digitally controlled pulse width modulated motor speed control for servo positioning systems. 4,388,570, Cl. 318-255.000.

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Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.

Sano, Kounosuke; and Tsuchida, Takayasu, to Ajinomoto Company Incorporated. Method for producing L-histidine by fermentation. 4,388,405, Cl. 435-107.000.

Sano, Tadao, to Kyushu Hitachi Maxell, Ltd. Portable electric flashlight. 4,388,674, Cl. 362-186.000.

Sano, Yoshio: *See*—
Hirao, Shozo; Saihara, Yasuhiro; Nakanishi, Toshio; Ihara, Ichiro; and Sano, Yoshio, 4,388,133, Cl. 156-245.000.

Sanofi: *See*—
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Santagata, Daniel A.: *See*—
Keep, Henry, Jr.; Santagata, Daniel A.; Harris, Matthew E.; and Welsh, William H., Jr., 4,388,523, Cl. 219-541.000.

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Reif, Robert B.; and McCrady, Paul E., 4,388,089, Cl. 55-119.000.

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Koyama, Shozo; Manning, John W., Jr.; Ammons, William S.; and Santiesteban, Hector L., 4,388,318, Cl. 424-251.000.

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Ishida, Hideo; Kitada, Masashi; and Ihara, Keisaku, 4,388,215, Cl. 252-402.000.

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Salzer, Thomas E.; and Saxelby, John R., Jr., 4,388,512, Cl. 219-56.220.
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Schlegel, Wolfgang; Wilke, Arthur; and Birkert, Rolf, 4,387,886, Cl. 269-71.000.
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Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,388,207, Cl. 252-174.110.
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Schubert & Salzer: *See*—
Studtmann, Rainer; and Bock, Erich, 4,387,556, Cl. 57-273.000.
Schuller, Ronald A., to Geosource, Inc. Manifold unit and assembly and fluid end assembly. 4,388,050, Cl. 417-454.000.
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Schulte, Eric F.; and Porter, Vernon R., to Texas Instruments Incorporated. Sublimation patterning process. 4,388,517, Cl. 219-121.0LJ.
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Schwartz, Vern R.; and Benz, Bernard D., to Verbatim Corporation. Leader to hub locking system. 4,387,499, Cl. 29-564.600.
Schwarz, Richard A., to Cosden Technology, Inc. Foamable polymeric styrene particles. 4,388,418, Cl. 521-56.000.
Schwarze, Rigobert. Tube feeding device. 4,388,039, Cl. 414-748.000.
Scientific Columbus, Inc.: *See*—
Haferd, James E., 4,388,611, Cl. 340-347.0SH.
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Klein, Reuben; and Klein, Imrich, 4,387,997, Cl. 366-79.000.
SCM Corporation: *See*—
Kennell, Samuel C.; and Witkiewicz, Ronald F., 4,388,424, Cl. 523-219.000.
Scott, Candice C., executrix: *See*—
Pratt, Roy E.; Sayles, Scott M.; Bowers, Kerry W.; and Scott, Richard P., deceased, 4,388,176, Cl. 208-80.000.
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Kaplan, Robert A.; and Wellman, James E., 4,388,064, Cl. 431-265.000.
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Scripps Clinic & Research Foundation: *See*—
Katz, David H., 4,388,441, Cl. 525-54.100.
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Seberg, Charles H.; and Harma, Jack L., to Abbott Laboratories. Winged catheter placement assembly. 4,388,074, Cl. 604-165.000.
Segal, John A.: *See*—
Hartshorn, Angus J.; Jones, Eric; and Segal, John A., 4,388,220, Cl. 252-429.00B.
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Seidel, Horst: *See*—
Magedanz, Norbert; Seidel, Horst; and Weiss, Hans J., 4,388,174, Cl. 208-11.00R.
Seki, Masahiko; Wada, Koji; and Io, Yukito, to Nippon Steel Corporation. Structure of oxygen passage in steel converter vessel supporting trunnion. 4,387,884, Cl. 266-246.000.
Sekido, Satoshi; and Sotomura, Tadashi, to Matsushita Electric Industrial Company, Limited. Solid electrolyte photocell. 4,388,385, Cl. 429-111.000.

Sekiguchi, Tetsuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens mount barrel. 4,387,968, Cl. 350-429.000.
Selder, Harald, to Escher Wyss GmbH. Method for operating an installation for processing waste paper. 4,387,856, Cl. 241-28.000.
Selfix, Inc.: *See*—
Ragir, Meyer J.; and Mayer, Joseph B., 4,387,811, Cl. 211-119.000.
Seliger, Robert L.: *See*—
Robinson, William P.; McNulty, Hugh, Jr.; Seliger, Robert L.; and Williamson, Weldon S., 4,388,560, Cl. 315-111.810.
Seliverstov, Vyacheslav V.: *See*—
Shipaev, Gennady A.; Seliverstov, Vyacheslav V.; Osipov, Nikolai A.; Prolygin, Anatoly P.; Mashikhin, Anatoly D.; Askinazi, Mikhail P.; Andreev, Jury M.; and Kagan, Samuil I., 4,387,569, Cl. 318-87.000.
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Sergeant, Ronald G., to AMP Incorporated. Chordal mechanism. 4,387,610, Cl. 81-5.10R.
Serov, German V.: *See*—
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.
Seto, Akira; and Sakita, Takashi, to Nisshin Oil Mills, Limited. Process for preparation of fish meat-like flaky foods. 4,388,341, Cl. 426-656.000.
Severino, Dino: *See*—
Nannini, Giuliano; Perrone, Ettore; Severino, Dino; Meinardi, Giuseppe; Monti, Gisella; Bianchi, Alberta; Forgione, Angelo; and Confalonieri, Carlo, 4,388,314, Cl. 424-246.000.
Seyler, Jay K.: *See*—
Orlowski, Ronald C.; and Seyler, Jay K., 4,388,235, Cl. 260-112.50T.
Shaffer, John W., to GTE Products Corporation. High intensity discharge lamp including arc extinguishing means. 4,388,557, Cl. 315-74.000.
Shaffer, John W.; and Brower, Boyd G., to GTE Products Corporation. Sequential photoflash array and fabrication employing radiation-activated switches. 4,388,606, Cl. 338-15.000.
Shaines, Alfred: *See*—
Kaufman, Edward R.; Benson, Gregory R.; and Shaines, Alfred, 4,388,423, Cl. 523-153.000.
Shakib, Iraj D.: *See*—
Mott, William E.; and Shakib, Iraj D., 4,388,010, Cl. 400-692.000.
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Fabricius, Hans-Ake; and Kottgen, Eckart U., 4,388,309, Cl. 424-180.000.
Shanley, Robert L., II: *See*—
Harwood, Leopold A.; Shanley, Robert L., II; and Hettiger, James, 4,388,647, Cl. 358-166.000.
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Hara, Yoshiyuki, 4,387,965, Cl. 350-349.000.
Osaki, Mikio; Tabuchi, Toshiaki; and Shimazawa, Yoichi, 4,388,630, Cl. 346-140.00R.
Shaub, Harold: *See*—
Brownawell, Darrell W.; Shaub, Harold; Wisotsky, Max J.; and Gutierrez, Antonio, 4,388,201, Cl. 252-49.600.
Shaw, David N.; and Gagnon, Joseph A. L. N., to Dunham Bush, Inc. Stepping type unloading system for helical screw rotary compressor. 4,388,048, Cl. 417-310.000.
Shaw, Jerry: *See*—
Poole, Michael M.; Solitt, Samuel G.; and Shaw, Jerry, 4,387,806, Cl. 206-232.000.
Shaw, Robert L.: *See*—
Maes, Michel E.; Shaw, Robert L.; and Reinsch, Royal L., 4,388,254, Cl. 264-3.00C.
Shay, George C., to Corning Glass Works. Method of forming a battery cell. 4,387,505, Cl. 29-623.100.
Shearing, Scott J. G.; and Bache, Ronald R. Container for thin flat articles. 4,387,802, Cl. 206-45.000.
Sheinkop, Isac M.: *See*—
Hall, Herbert L., Jr.; and Sheinkop, Isac M., 4,388,721, Cl. 373-31.000.
Shell Oil Company: *See*—
Diaz, Zaida, 4,388,293, Cl. 423-573.00R.
Kramer, Petrus A.; and Verbrugge, Pieter A., 4,388,247, Cl. 260-463.000.
Powell, James E.; and Barker, Michael D., 4,388,104, Cl. 71-88.000.
Shelley, Edwin F. Electronic sundial apparatus. 4,387,999, Cl. 368-15.000.
Shellhause, Ronald L., to General Motors Corporation. Pressure proportioner. 4,387,932, Cl. 303-24.00F.
Shen, C. Anthony. Knee brace. 4,387,709, Cl. 128-87.00R.
Shepherd, Gary D.; Fernandez, Ramon B.; and Rule, Ian R., to Hitco. Method of removing alkali and alkaline earth metal impurities from oxidized pan material. 4,388,289, Cl. 423-447.400.
Shepherd, Robert G., to American Cyanamid Company. Certain cinnamic acid or propiolic acid derivatives. 4,388,459, Cl. 542-427.000.
Sheppard, Douglas P., to Mostek Corporation. Multi-bit read only memory circuit. 4,388,702, Cl. 365-104.000.
Sheppard, Douglas P., to Mostek Corporation. Semiconductor memory circuit. 4,388,705, Cl. 365-210.000.
Sherman, David L., to Atari, Inc. Method and apparatus for generating elliptical images on a raster-type video display. 4,388,620, Cl. 340-744.000.
Sherman, Randy J., to Lincoln Laser Co. Method and apparatus for generating a scanned optical output signal. 4,388,651, Cl. 358-206.000.
Sherritt Gordon Mines Limited: *See*—
Kunda, Wasyl, 4,388,109, Cl. 75-0.50B.
Sherwin, Robert M.: *See*—
Abrams, Jack Z.; and Sherwin, Robert M., 4,388,283, Cl. 423-242.000.
Shiba, Haruo, to TDK Electronics Co., Ltd. Magnetic tape cassette. 4,387,823, Cl. 220-4.00R.
Shibata, Seiichi, to Casio Computer Co., Ltd. Note-paper sheet issuance device. 4,388,629, Cl. 346-81.000.
Shigihara, Akira: *See*—
Hamane, Masumi; Shigihara, Akira; and Kato, Masaie, 4,387,606, Cl. 74-752.00E.
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Osaki, Mikio; Tabuchi, Toshiaki; and Shimazawa, Yoichi, 4,388,630, Cl. 346-140.00R.
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Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,387,986, Cl. 355-75.000.
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Uchidoi, Masanori; Aizawa, Hiroshi; Urushihara, Kazunobu; Suzuki, Nobuyuki; and Shimizu, Masami, 4,387,977, Cl. 354-60.00R.
Shimp, David A., to Celanese Corporation. Water reducible coating composiions. 4,388,374, Cl. 428-414.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Nakazato, Yasuaki; Miyazaki, Yasushi; Osuga, Makoto; and Kodaira, Masao, 4,388,140, Cl. 156-345.000.
Shinozaki, Fumiaki; Namiki, Tomizo; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Light-sensitive image-forming material. 4,388,399, Cl. 430-271.000.
Shinshu Seiki Kabushika Kaisha: *See*—
Mikoshiba, Hitoshi; Fujimori, Kazuyoshi; Onodera, Kenji; and Takeuchi, Shin, 4,387,643, Cl. 101-110.000.
Shiobara, Masaji: *See*—
Yoshiba, Yasutaka; and Shiobara, Masaji, 4,387,694, Cl. 123-571.000.
Shioi, Yuji, to Yoshida Industry Co., Ltd. Vanity case. 4,387,730, Cl. 132-83.00R.
Shipaev, Gennady A.; Seliverstov, Vyacheslav V.; Osipov, Nikolai A.; Prolygin, Anatoly P.; Mashikhin, Anatoly D.; Askinazi, Mikhail P.; Andreev, Jury M.; and Kagan, Samuil I. System for automatic control of dynamic braking of independent transport facility. 4,388,569, Cl. 318-87.000.
Shiraishi, Mitsuru: *See*—
Terao, Shinji; Shiraishi, Mitsuru; and Kato, Kaneyoshi, 4,388,312, Cl. 424-244.000.
Shirasaki, Masataka; and Obokata, Takeshi, to Fujitsu Limited. Optical waveguide device with phase matching layers. 4,387,953, Cl. 350-96.140.
Shirey, Ray A., to Westinghouse Electric Corp. Corrugated pipe adhesive applicator apparatus. 4,387,662, Cl. 118-105.000.
Shizuoka Seiki Co., Ltd.: *See*—
Mizuno, Akira; and Suzuki, Shigeo, 4,388,047, Cl. 417-299.000.
Shore, Sheldon G.; and Toft, Mark A., to Ohio State University Research Foundation, The. Dry process for producing diborane. 4,388,284, Cl. 423-295.000.
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Suzuki, Kazuaki; and Kuwabara, Shohei, 4,388,079, Cl. 8-648.000.
Shum, Ming S.; Janikowski, Daniel S.; and Bradley, Steven A., to UOP Inc. Conductive pigment-coated surfaces. 4,388,347, Cl. 427-96.000.
Shuskus, Alexander J.; and Cowher, Melvyn E., to United Technolgies Corporation. Method of repairing surface defects in coated laser mirrors. 4,388,344, Cl. 427-38.000.
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Binasik, Chester S.; and Siegert, Louis D., 4,387,654, Cl. 110-347.000.
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Beifuss, Wolfgang; Birzele, Paul; and Geitz, Gerhard, 4,388,683, Cl. 364-200.000.
Blaschke, Felix; and Salzmann, Theodor, 4,388,577, Cl. 318-717.000.
Brunner, Karl; Barking, Hans; and Didschies, Gunter, 4,388,127, Cl. 156-53.000.
Fromm, Ingrid, 4,387,785, Cl. 181-142.000.
Gerke, Peter; and Petersen, Joachim, 4,388,718, Cl. 370-110.100.
Giebel, Burkhard, 4,388,541, Cl. 307-530.000.
Konstantouros, Efthimios; and Hoeck, Karl, 4,388,276, Cl. 422-187.000.
Mueller, Gerhard; and Puritscher, Ernst, 4,388,072, Cl. 493-410.000.
Mueller, Gerhard H., 4,387,638, Cl. 101-1.000.
Petrossian-Avakian, Edmond, 4,388,487, Cl. 174-40.00R.
Richter, Gerhard; Weidlich, Erhard; and Mund, Konrad, 4,388,163, Cl. 204-101.000.
Schneider, Hartmut; and Lebetzki, Egon, 4,388,095, Cl. 65-18.200.
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Billhartz, Larry E., 4,388,670, Cl. 361-367.000.
Sien, Herbert P.; and McGinley, Thomas J., to Suntech, Inc. Coker feedstock analysis method. 4,388,408, Cl. 436-60.000.
Sievers, Robert A.: *See—*
Kornbau, Thomas W.; and Sievers, Robert A., 4,388,388, Cl. 430-258.000.
Silfvast, William T.; Szeto, Leo H.; and Wood, Obert R., II, to Bell Telephone Laboratories, Incorporated. External control of recombination rate for electron-ion recombination lasers. 4,388,720, Cl. 372-76.000.
Siminski, Vince J.: *See—*
Bartok, William; Song, Yih H.; Siminski, Vince J.; and Longwell, John P., 4,388,062, Cl. 431-10.000.
Simmons, Carlton J., Jr., to Baldwin Piano & Organ Co. Harmony generator for electronic organ. 4,387,618, Cl. 84-1.030.
Simon, Wayne E., to Martin Marietta Corporation. Apparatus and method for mixing and pumping fluids. 4,388,045, Cl. 417-54.000.
Simpson, Frederick H., to Boeing Aerospace Co. (A Division of the Boeing Company). Method for producing pre-shaped α-silicon nitride whisker compacts and loose whiskers for composite material reinforcement. 4,388,255, Cl. 264-29.100.
Sinclair, Richard G.: *See—*
Erbstoesser, Steven R.; Cooke, Claude E., Jr.; Sinclair, Richard G.; and Epstein, Michael M., 4,387,769, Cl. 166-295.000.
Skaale, Douglas E., to Boeing Company, The. Endwise pushdown guide and lateral restraint fitting for cargo. 4,388,030, Cl. 410-69.000.
SKF Kugellagerfabriken GmbH: *See—*
Brandenstein, Manfred; Ernst, Horst M.; and Walter, Lothar, 4,387,938, Cl. 308-184.00R.
Walter, Lothar; Olschewski, Armin; Kispert, Klaus; and Meining, Hans, 4,387,939, Cl. 308-217.000.
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Slater Electric Inc.: *See—*
Meehan, James E., 4,387,746, Cl. 140-105.000.
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Carr, Marvin K.; and Smith, Cheryl D., 4,387,837, Cl. 224-42.210.
Smith & Denison: *See—*
Burkhart, William H., 4,388,168, Cl. 204-196.000.
Smith, Donald R. Material dispenser toothbrush. 4,388,011, Cl. 401-173.000.
Smith International, Inc.: *See—*
Herbert, Roger F., 4,387,774, Cl. 175-40.000.
Smith Kline & French Laboratories Limited: *See—*
Brown, Thomas H., 4,388,317, Cl. 424-248.510.
Durant, Graham J.; and Ganellin, Charon R., 4,388,319, Cl. 424-270.000.
Smith, Michael: *See—*
Hopper, Michael J.; Martin, Michael R.; Bolt, Lawrence; Smith, Michael; and Tavasolian, Ali, 4,388,375, Cl. 428-423.700.
Smith, Morley L., to T. S. Simms & Co. Limited. Hand tools. 4,387,478, Cl. 15-145.000.
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Smith, Roger R., to United States of America, Army. Annular seal. 4,387,903, Cl. 277-212.0FB.
SmithKline Beckman Corporation: *See—*
Dewey, Richard H.; Hwang, Bruce Y.; and Kuo, George Y., 4,388,240, Cl. 260-239.0BB.
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Rush, Derek A.; and Swadling, Roger D., 4,388,613, Cl. 340-347.00P.
SMW Schneider & Weisshaupt GmbH: *See—*
Hiestand, Karl, 4,387,907, Cl. 279-4.000.
Snamprogetti S.P.A.: *See—*
Brandolese, Ernesto, 4,388,199, Cl. 252-33.600.
Sneed, Robert C., Jr.; MacNaughton, Robert G.; and Jacobsen, James H., to Varian Associates, Inc. Symmetrizing means for RF coils in a microwave cavity. 4,388,601, Cl. 333-227.000.
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Orzalesi, Giovanni, 4,388,325, Cl. 424-319.000.
Societe Anonyme DBA: *See—*
Tobiasz, Andre, 4,387,737, Cl. 137-625.210.
S.A. des Etablissements Staubli: *See—*
Palau, Joseph; and Bourgeaux, Pierre, 4,387,741, Cl. 139-66.00R.
Societe Anonyme dite: Compagnie Lyonnaise de Trandmissions Optiques: *See—*
Mignien, Georges, 4,387,957, Cl. 350-96.210.
Societe Chimique des Charbonnages - CdF CHIMIE: *See—*
Bujadoux, Karel, 4,388,219, Cl. 252-429.00C.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Buhler, Marcel; and Olofsson, Mats, 4,388,329, Cl. 426-40.000.
Devenux, Rene, 4,388,334, Cl. 426-112.000.
Societe Europeenne de Propulsion: *See—*
Fournier, Jean-Pierre; and Cabillic, Jacques, 4,387,937, Cl. 340-682.000.
Societe Industrielle Bertrand Faure: *See—*
Boisset, Bernard, 4,387,874, Cl. 248-396.000.
Societe Nationale de L'Amiante: *See—*
Kimmerle, Frank M.; and Roberge, Pierre, 4,388,149, Cl. 162-153.000.
Societe Sogefina, Societe de Gestion Financiere Armoricaine: *See—*
Herriau, Paul, 4,387,656, Cl. 111-86.000.
Sodex-Magister: *See—*
Meunier, Pierre, 4,387,582, Cl. 70-186.000.
Sokoly, Theodore O.: *See—*
Hassler, Stephen P.; and Sokoly, Theodore O., 4,388,603, Cl. 337-158.000.
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Poole, Michael M.; Solitt, Samuel G.; and Shaw, Jerry, 4,387,806, Cl. 206-232.000.
Solomon, Paul W., to Phillips Petroleum Company. Olefin oxidation with supported CuO catalyst. 4,388,225, Cl. 252-463.000.
Soltysik, George E.; and Anderson, John C. R., to Loranger Manufacturing Company. Dynamic signal generator. 4,388,719, Cl. 371-27.000.
Sommers-Szoszky, Paul. Interchangeable illuminated sign. 4,387,522, Cl. 40-576.000.
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Bartok, William; Song, Yih H.; Siminski, Vince J.; and Longwell, John P., 4,388,062, Cl. 431-10.000.
Sony Corporation: *See—*
Yamashita, Noriyuki, 4,388,596, Cl. 331-1.00A.
Sooter, Matthew C.: *See—*
Wasson, George E.; Theodore, Frank W.; Boyer, Lyndon D.; and Sooter, Matthew C., 4,388,152, Cl. 201-6.000.
Sotomura, Tadashi: *See—*
Sekido, Satoshi; and Sotomura, Tadashi, 4,388,385, Cl. 429-111.000.
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Davis, Thomas A.; and Cowsar, Donald R., 4,388,358, Cl. 428-71.000.
Spartus Corporation: *See—*
Rigazio, Anthony W.; Mathieson, Donald E.; and Hawkinson, Paul E., 4,388,002, Cl. 368-88.000.
Spector, Abner. Effects box system and method. 4,388,490, Cl. 179-1.00B.
Spector, George: *See—*
Lewandowski, Raymond J.; and Spector, George, 4,387,534, Cl. 47-66.000.
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Spencer, Paul A.; and Dolby, Ray M., to Dolby Laboratories, Inc. Systems for reducing noise in video signals using amplitude averaging of undelayed and time delayed signals. 4,388,729, Cl. 455-72.000.
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Freitag, Lonny R., 4,388,038, Cl. 414-685.000.
Huie, Jaken Y.; and Jacobus, Dan, 4,388,136, Cl. 156-252.000.
Young, Terry A.; Mann, William W.; Kline, Charles M.; and Schoeneberger, Ernest A., 4,387,857, Cl. 241-101.00B.
Spiegel, Raymond W., to Whirlpool Corporation. Method of forming a spray arm. 4,387,496, Cl. 29-416.000.
Spiess, Irwin: *See—*
Baumann, Robert P.; Blais, Marcel; and Spiess, Irwin, 4,388,458, Cl. 536-38.000.
Sprague Electric Company: *See—*
Richardson, William E., 4,388,632, Cl. 357-15.000.
Sprecher & Schuh AG: *See—*
Roth, Adrian W.; and Morva, Tibor, 4,388,507, Cl. 200-148.00R.
Sproul, William D.: *See—*
Dockus, Kostas F.; and Sproul, William D., 4,388,159, Cl. 204-33.000.
Square D Company: *See—*
Penland, William D.; and Loew, Harold F., 4,388,503, Cl. 200-5.00R.
Stafford, George C.; and Stephens, David R., to Finnigan Corporation. Ionizer having interchangeable ionization chamber. 4,388,531, Cl. 250-427.000.
Stalev, Valery I.: *See—*
Rozenberg, Vladimir L.; Brukovsky, Igor P.; Nekhamin, Sergei M.; Ryss, Mark A.; Pelts, Boris B.; Serov, German V.; Popov, Alexandr N.; Bogoljubov, Gennady D.; Ryazantsev, Leonid A.; Ioffe, Jury S.; Fridman, Grigory B.; Boitsov, Leonid I.; Andrienko, Petr D.; Kovalev, German V.; Sankov, Sergei A.; Fomenko, Vladimir V.; Stalev, Valery I.; Greditor, Pavel K.; Petrov, Stanislav V.; and Mashyanov, Vladimir G., 4,388,108, Cl. 75-10.00R.
Stamicarbon, B.V.: *See—*
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Stanbrough, Michael J.: *See*—
Yahrmarkt, Richard A.; and Stanbrough, Michael J., 4,388,148, Cl. 162-26.000.
Standard Oil Company, The: *See*—
Reagan, John J., 4,387,768, Cl. 166-256.000.
Standard Oil Company (Indiana): *See*—
Fields, Ellis K.; and Anderson, Ronald L., 4,388,470, Cl. 549-240.000.
Stanic, Uros: *See*—
Plevnik, Stanislav; Vrtacnik, Peter; Malezic, Matija; Lukezic, Marino; Stanic, Uros; and Oblak, Pavel, 4,387,719, Cl. 128-421.000.
Stanley, Michael R., to Xerox Corporation. Charged particle containment apparatus. 4,387,982, Cl. 355-3.0DD.
Stark, Robert: *See*—
Timbers, Gordon E.; Stark, Robert; Caron, Jacques C.; Cumming, Daniel B.; Cowmeadow, Richard R.; and Gingell, Alexander W., 4,387,630, Cl. 99-348.000.
Starzak, Marian: *See*—
Knypl, Maria; Knypl, Eugeniusz; Starzak, Marian; Mieczkowska, Ewa; Pawlus, Urszula; Palubicki, Romuald; Ficek, Mieczyslaw; and Goldynia, Jozef, 4,388,438, Cl. 524-833.000.
Stauber, Ronald C.: *See*—
Pavlo, John A.; and Stauber, Ronald C., 4,387,873, Cl. 248-226.400.
Stauffer Chemical Company: *See*—
Gutman, Arnold D.; and Williams, John W., 4,388,249, Cl. 260-465.00F.
Stavish, Michael F.; and Reti, Aldo M., to Handy & Harman. Rhenium-bearing copper-nickel-tin alloys. 4,388,270, Cl. 420-473.000.
Steel, Charles F. Hand racket. 4,387,895, Cl. 273-67.00B.
Steele, Gerald H.: *See*—
Schure, Ralph M.; and Steele, Gerald H., 4,388,426, Cl. 523-462.000.
Stein, Stanley, to Hoffmann-La Roche Inc. Enkephalin-like compounds in bovine adrenal medulla. 4,388,236, Cl. 260-112.50R.
Steiner, Gerd; Franke, Albrecht; Lenke, Dieter; Teschendorf, Hans-Juegen; Worstmann, Wolfgang; and Kreiskott, Horst, to BASF Aktiengesellschaft. 6(1-Piperazinyl), piperidino and (1(homopiperazinyl)11-cyanomethylene morphanthridines. 4,388,237, Cl. 260-239.0BC.
Stendel, Wilhelm: *See*—
Fuchs, Rainer; Naumann, Klaus; Hammann, Ingeborg; and Stendel, Wilhelm, 4,388,322, Cl. 424-304.000.
Stephens, David R.: *See*—
Stafford, George C.; and Stephens, David R., 4,388,531, Cl. 250-427.000.
Sterling Drug Inc.: *See*—
Margulies, Herman, 4,387,832, Cl. 221-63.000.
Stern, Georg: *See*—
Bartel, Gunter; Patz, Eckhard; Koch, Karl; Stern, Georg; Stotz, Manfred; and Triffterer, Adolf, 4,388,053, Cl. 417-542.000.
Stettler, Hans; Buser, Karl; and Chavannes, Jean-Pierre, to Sandoz Ltd. Phosphate-free cleaning compositions. 4,388,205, Cl. 252-135.000.
Stevens, Richard W., to Milwaukee Boiler Manufacturing Co. Tunnel excavator. 4,387,928, Cl. 299-33.000.
Stevens, Samuel B.; and Lytle, James R., Sr., to Caterpillar Tractor Co. Bulk material handler and feeder. 4,387,842, Cl. 226-113.000.
Stewart, Robert E.: *See*—
Kotok, Alan; Murphy, Daniel L.; and Stewart, Robert E., 4,388,685, Cl. 364-200.000.
Stinton, Robert T.: *See*—
Long, Richard W.; and Stinton, Robert T., 4,388,134, Cl. 156-248.000.
Stohler, Robert A.; and Murray, Benjamin D., to United States of America, Navy. Lifting and stowage system. 4,388,032, Cl. 414-95.000.
Stolzer, Claus: *See*—
Elbe, Hans-Ludwig; Arold, Hermann; Kranz, Eckart; and Stolzer, Claus, 4,388,465, Cl. 548-262.000.
Stork, Karl: *See*—
Oppenlaender, Knut; Stork, Karl; and Barthold, Klaus, 4,388,213, Cl. 252-392.000.
Oppenlaender, Knut; Stork, Karl; and Barthold, Klaus, 4,388,214, Cl. 252-392.000.
Stotz, Manfred: *See*—
Bartel, Gunter; Patz, Eckhard; Koch, Karl; Stern, Georg; Stotz, Manfred; and Triffterer, Adolf, 4,388,053, Cl. 417-542.000.
Strachan, John S.: *See*—
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Straszer, Rudolf: *See*—
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Straubel, Max: *See*—
Leblanc, Jean; Pigeroulet, Jean; Straubel, Max; and Eckert, Konrad, 4,387,686, Cl. 123-446.000.
Streeter, Arnet. Air scrubber. 4,388,090, Cl. 55-228.000.
Strehler, Hugo; Hoerauf, Werner; and Valentin, Guenter, to BASF Aktiengesellschaft. Production of concentrates of titanium dioxide in polycaprolsctam. 4,388,425, Cl. 523-333.000.
Strohm & Maier Labormobel GmbH: *See*—
Maier, Klaus, 4,387,941, Cl. 312-194.000.
Strother, John A., to RCA Corporation. Low-distortion detection of pulses superimposed on an unknown and variable background signal. 4,388,646, Cl. 358-160.000.
Strub, Eric W.; and Strub, Kenneth M. Banding apparatus. 4,387,553, Cl. 53-585.000.
Strub, Kenneth M.: *See*—
Strub, Eric W.; and Strub, Kenneth M., 4,387,553, Cl. 53-585.000.
Stuart, R. Daniel: *See*—
Grey, James S.; Stuart, R. Daniel; and Lake, Edwin D., 4,387,605, Cl. 74-694.000.
Studer, Philip A., to United States of America, National Aeronautics and Space Administration. Linear magnetic bearing. 4,387,935, Cl. 308-10.000.
Studtmann, Rainer; and Bock, Erich, to Schubert & Salzer. Apparatus for lifting a bobbin from a spindle. 4,387,556, Cl. 57-273.000.
Styles, Alan E.: *See*—
Franek, Josef T.; Porucznik, Paul; and Styles, Alan E., 4,387,747, Cl. 141-1.000.
Suarez, Alfred. Hoist accessory for pallet trucks. 4,388,037, Cl. 414-607.000.
Sudo, Masatoshi; Hashimoto, Shunichi; and Kambe, Shoji, to Kabushiki Kaisha Kobe Seiko Sho. Method of making high strength hot rolled steel sheet having excellent flash butt weldability, fatigue characteristic and formability. 4,388,122, Cl. 148-12.00F.
Sueyasu, Masanobu: *See*—
Okane, Koji; Okamura, Shozo; Sueyasu, Masanobu; Masuda, Seiichi; Tanaka, Tsutomu; and Tanaka, Koichi, 4,388,084, Cl. 48-197.00R.
Sugano, Junichiro; Yui, Tomoyuki; Minamikawa, Yoshitugu; and Fujimoto, Tsuneo, to Mitsubishi Gas Chemical Company, Inc. Process for producing sodium percarbonate. 4,388,287, Cl. 423-415.00P.
Sugano, Nobukazu, to Matsushita Electric Industrial Co., Ltd. Clutch motor arrangement. 4,387,793, Cl. 192-0.02R.
Suganuma, Tetsuya; Fuwa, Yoshio; Fujita, Shuichi; and Takahashij Yoshitaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Anti-wear sintered alloy. 4,388,114, Cl. 75-243.000.
Sugimura, Noboru: *See*—
Matsuda, Hideki; Makino, Shigeo; and Sugimura, Noboru, 4,387,758, Cl. 152-353.00R.
Sugiura, Shinji; and Horibe, Kyoichi, to Kansai Paint Co., Ltd. Heat-curable coating composition. 4,388,445, Cl. 525-124.000.
Sugiyama, Masatoshi; Ogawa, Akira; and Imai, Shinichi, to Fuji Photo Film Co., Ltd. Aqueous ink composition. 4,388,115, Cl. 106-22.000.
Suimon, Yoshio, to ICD Corporation. Toy remote-control motor bicycle. 4,387,532, Cl. 46-254.000.
Sullivan, John; and Lillibridge, Harold R., to Champion International Corporation. Gum applying apparatus. 4,388,071, Cl. 493-333.000.
Sumida, Morihiro: *See*—
Nakashima, Hiroyuki; Sumida, Morihiro; and Goto, Hiroki, 4,388,112, Cl. 75-51.000.
Sumitomo Chemical Company, Limited: *See*—
Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, 4,388,469, Cl. 549-59.000.
Sumitomo Electric Industries, Ltd.: *See*—
Kimura, Takao; and Yamanishi, Toru, 4,388,093, Cl. 65-3.110.
Sumitomo Metal Industries, Ltd.: *See*—
Okane, Koji; Okamura, Shozo; Sueyasu, Masanobu; Masuda, Seiichi; Tanaka, Tsutomu; and Tanaka, Koichi, 4,388,084, Cl. 48-197.00R.
Sunden, Olof; Batelson, Per G.; Johansson, Hans E.; Larsson, Hans M.; and Svending, Per J., to Eka Aktiebolag. Papermaking and products made thereby. 4,388,150, Cl. 162-175.000.
Sundermann, Rudolf; Konig, Klaus; Engbert, Theodor; Becker, Gernot; and Hammen, Gunther, to Bayer Aktiengesellschaft. Process for the preparation of polyisocyanates. 4,388,246, Cl. 260-453.00P.
Suntech, Inc.: *See*—
Sien, Herbert P.; and McGinley, Thomas J., 4,388,408, Cl. 436-60.000.
Suntola, Tuomo; and Antson, Jorma O., to Ou Lohja Ab. Electroluminescent display component. 4,388,554, Cl. 313-505.000.
Suominen, Heikki S. Tubular insulating curtain and method of manufacture. 4,388,354, Cl. 428-12.000.
Suzuki, Hajime; Umemura, Yoshifumi; and Kimbara, Masahiko, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Apparatus for regulating tension in warps of a weaving machine. 4,387,743, Cl. 139-110.000.
Suzuki, Kazuaki; and Kuwabara, Shohei, to Showa Kagaku Kogyo Co., Ltd. Color salt-containing optical brightener composition. 4,388,079, Cl. 8-648.000.
Suzuki, Nobuyuki: *See*—
Uchidoi, Masanori; Aizawa, Hiroshi; Urushihara, Kazunobu; Suzuki, Nobuyuki; and Shimizu, Masami, 4,387,977, Cl. 354-60.00R.
Suzuki, Shigeo: *See*—
Mizuno, Akira; and Suzuki, Shigeo, 4,388,047, Cl. 417-299.000.
Suzuki, Shin-ichi; Kitoh, Shinya; Toda, Haruhiko; and Higo, Moriaki, to Lion Corporation. N-(2-Hydroxy-3-methacryloyloxypropyl)-aminobenzoic acid derivatives and dental adhesive composition containing same. 4,388,421, Cl. 523-118.000.
Suzuki, Shuichi; Aizawa, Masuo; Koyama, Masao; Sato, Yuichi; and Koezuka, Junji, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrochemical measuring apparatus provided with an enzyme electrode. 4,388,166, Cl. 204-403.000.
Suzuki, Takaya; Inoue, Yosuke; and Aoyama, Takashi, to Hitachi, Ltd. Method for chemical vapor deposition. 4,388,342, Cl. 427-8.000.
Svending, Per J.: *See*—
Sunden, Olof; Batelson, Per G.; Johansson, Hans E.; Larsson, Hans M.; and Svending, Per J., 4,388,150, Cl. 162-175.000.

Swadling, Roger D.: *See*—
Rush, Derek A.; and Swadling, Roger D., 4,388,613, Cl. 340-347.00P.

Swartz, Peter J. Rotatable cuvette array. 4,387,992, Cl. 356-246.000.

Sweeney, Raymond G.; and Rammer, William L., to Badger Northland, Inc. Tapered bed feeder. 4,387,799, Cl. 198-735.000.

Swendrowski, Steven D.: *See*—
Lauriello, Alfred F.; and Swendrowski, Steven D., 4,387,946, Cl. 339-66.00M.

Swift, Graham; Cenci, Harry J.; and Jenkins, Raymond F., to Rohm and Haas Company. Lithographic ink vehicle containing addition polymer and aliphatic hydrocarbon solvent. 4,388,434, Cl. 524-476.000.

Sybron Corporation: *See*—
Rosenfeldt, Wolfgang, 4,388,572, Cl. 318-317.000.

Symons, Robert S.; and Jory, Howard R., to Varian Associates, Inc. Gyrotron with improved stability. 4,388,555, Cl. 315-4.000.

Syntex (U.S.A.) Inc.: *See*—
Fu, Cherng-Chyi, 4,388,229, Cl. 252-549.000.

Szeto, Leo H.: *See*—
Silfvast, William T.; Szeto, Leo H.; and Wood, Obert R., II, 4,388,720, Cl. 372-76.000.

Szigeti, Elemer. Device for mixing and distributing a two-constituent product. 4,387,998, Cl. 366-130.000.

Szporny, Laszlo: *See*—
Nyeki, Olga; Kisfaludy, Lajos; Karpati, Egon; and Szporny, Laszlo, 4,388,304, Cl. 424-177.000.

T. D. Williamson, Inc.: *See*—
Vanzant, Hershel, 4,387,740, Cl. 138-89.000.

T. S. Simms & Co. Limited: *See*—
Smith, Morley L., 4,387,478, Cl. 15-145.000.

Tabei, Masatoshi; Wada, Minoru; Takahashi, Yonosuke; and Yoshida, Satoshi, to Fuji Photo Film Co., Ltd. Heat-mode recording material. 4,388,400, Cl. 430-346.000.

Tabuchi, Toshiaki: *See*—
Osaki, Mikio; Tabuchi, Toshiaki; and Shimazawa, Yoichi, 4,388,630, Cl. 346-140.00R.

Tachiuchi, Tsuguji: *See*—
Komatsu, Shigeru; Hirahata, Shigeru; and Tachiuchi, Tsuguji, 4,388,621, Cl. 340-802.000.
Komatsu, Shigeru; Mizukami, Kazushi; Tachiuchi, Tsuguji; Nagai, Kunihiko; and Koyama, Takuo, 4,388,707, Cl. 365-230.000.

Tada, Yoshiharu; and Kitano, Yuichi, to Diesel Kiki Kabushiki Kaisha. Control circuit for automobile electro-magnetic driving equipment. 4,388,571, Cl. 318-293.000.

Tahara, Seiichiro: *See*—
Nishikawa, Syuzi; Matsubara, Toru; Iida, Kazuyoshi; and Tahara, Seiichiro, 4,388,427, Cl. 523-500.000.

Takada, Juichiro. Seat belt system using lap belt having energy absorption capacity. 4,387,911, Cl. 280-802.000.

Takagi, Katsuaki; and Kita, Yuzo, to Hitachi, Ltd. Signal converter. 4,388,612, Cl. 340-347.0DA.

Takahashi, Akira: *See*—
Tsunetomi, Katashi; Takahashi, Akira; and Tsuji, Katsuyuki, 4,387,680, Cl. 123-198.00F.

Takahashi, Nobuyuki, to Anelva Corporation. Processing apparatus comprising a cassette member temporarily swingable to vertically hold a plurality of substrates. 4,388,034, Cl. 414-331.000.

Takahashi, Shiro; Sanada, Kazuo; Inada, Koichi; and Fukuda, Osamu, to Nippon Telegraph & Telephone Public Corporation; and Fujikura Cable Works, Ltd. Apparatus for producing multi-component glass fiber preform. 4,388,098, Cl. 65-157.000.

Takahashi, Toru: *See*—
Hosono, Nagao; Kinoshita, Koichi; and Takahashi, Toru, 4,387,664, Cl. 118-658.000.

Takahashi, Yonosuke: *See*—
Tabei, Masatoshi; Wada, Minoru; Takahashi, Yonosuke; and Yoshida, Satoshi, 4,388,400, Cl. 430-346.000.

Takahashij Yoshitaka: *See*—
Suganuma, Tetsuya; Fuwa, Yoshio; Fujita, Shuichi; and Takahashij Yoshitaka, 4,388,114, Cl. 75-243.000.

Takao, Kengo; Ohmachi, Mineo; Kihara, Hisatsugu; Toki, Kenshiro; Tomita, Yukio; and Mizota, Toshihiro, to Nippon Steel Corporation; and Hitachi Shipbuilding & Engineering Company Limited. System for generating power with top pressure of blast furnaces. 4,387,562, Cl. 60-39.150.

Takavarasha, Murashiki-Job C. Suspension systems. 4,387,909, Cl. 280-104.000.

Takeda Chemical Industries, Ltd.: *See*—
Terao, Shinji; Shiraishi, Mitsuru; and Kato, Kaneyoshi, 4,388,312, Cl. 424-244.000.

Takematsu, Yoshiyuki. Intensity control circuit for an electronic flash device. 4,387,976, Cl. 354-33.000.

Takemoto, Iwao: *See*—
Koike, Norio; Sasano, Akira; Taniguchi, Yoshio; Nakano, Toshio; Aoki, Masakazu; and Takemoto, Iwao, 4,387,987, Cl. 355-133.000.

Takemura, Toru: *See*—
Ishida, Masamichi; Kamo, Jun; Takemura, Toru; Minami, Shunsuke; and Kamada, Kensuke, 4,388,256, Cl. 264-41.000.

Takemura, Yozo; Kobayashi, Isao; Akita, Yasuhiro; and Kato, Kaoru, to Nippon Steel Corporation. Method of preventing damage of an immersed tuyere of a decarburization furnace in steel making. 4,388,113, Cl. 75-51.000.

Takeshita, Toru: *See*—
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, 4,388,243, Cl. 260-397.200.

Takeuchi, Osamu; Hasegawa, Hiroshi; Izumi, Susumu; and Otsuki, Naoki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Nippon Steel Corporation. Metal heating furnace. 4,388,068, Cl. 432-122.000.

Takeuchi, Shin: *See*—
Mikoshiba, Hitoshi; Fujimori, Kazuyoshi; Onodera, Kenji; and Takeuchi, Shin, 4,387,643, Cl. 101-110.000.

Takezoe, Fumihiko; and Koyama, Minoru, to Fuji Electric Co., Ltd. Two-way transmission system. 4,388,716, Cl. 370-29.000.

Takimoto, Masaaki: *See*—
Miyoshi, Takahito; Okuta, Toshimitu; Takimoto, Masaaki; Saida, Takashi; Akashi, Goro; and Fujiyama, Masaaki, 4,388,360, Cl. 428-172.000.

Talonen, Timo T.; and Makinen, Tuula S. M., to Outokumpu Oy. Process for the recovery of lead from a lead-bearing sulfide concentrate. 4,388,111, Cl. 75-26.000.

Tamai, Kiminori; and Hayama, Masashi, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,388,369, Cl. 428-339.000.

Tamm, Hans F.: *See*—
Rodewald, Bernhard; Tippmer, Kurt; and Tamm, Hans F., 4,388,172, Cl. 208-10.000.

Tamura, Misao: *See*—
Kishida, Kazuo; Sasaki, Isao; Kushi, Kenji; and Tamura, Misao, 4,388,345, Cl. 427-54.100.

Tan, Hian-Bie: *See*—
Wobben, Hendrik J.; and Tan, Hian-Bie, 4,388,330, Cl. 426-51.000.

Tan-Hsu, Inri: *See*—
Hsu, Herbert H.; and Tan-Hsu, Inri, 4,387,471, Cl. 2-10.000.

Tanaka, Koichi: *See*—
Moriya, Shigeru; Yoshida, Akio; Tanaka, Koichi; and Nishimura, Yuji, 4,387,912, Cl. 280-804.000.
Okane, Koji; Okamura, Shozo; Sueyasu, Masanobu; Masuda, Seiichi; Tanaka, Tsutomu; and Tanaka, Koichi, 4,388,084, Cl. 48-197.00R.

Tanaka, Tsutomu: *See*—
Okane, Koji; Okamura, Shozo; Sueyasu, Masanobu; Masuda, Seiichi; Tanaka, Tsutomu; and Tanaka, Koichi, 4,388,084, Cl. 48-197.00R.

Tanaka, Yoshihiro: *See*—
Matsuda, Motonobu; and Tanaka, Yoshihiro, 4,387,988, Cl. 356-1.000.

Tani, Hakuzo, to Minolta Camera Co. Ltd. Multi-layer anti-reflection coating. 4,387,960, Cl. 350-164.000.

Taniguchi, Yasuo; Asano, Toshio; Funami, Haruo; and Itou, Kouichi, to Denki Kagaku Kogyo Kabushiki Kaisha. Stabilizer or dispersing agent for use in a suspension polymerization of a vinyl compound comprising a modified and partially hydrolyzed anionic polyvinyl alcohol. 4,388,442, Cl. 525-60.000.

Taniguchi, Yoshio: *See*—
Koike, Norio; Sasano, Akira; Taniguchi, Yoshio; Nakano, Toshio; Aoki, Masakazu; and Takemoto, Iwao, 4,387,987, Cl. 355-133.000.

Tanihara, Koichi, to Director-General of the Agency of Industrial Science and Technology. Method for the preparation of guanidine sulfamate. 4,388,474, Cl. 564-241.000.

Tanimoto, Masahiro, to Horiba, Ltd. Automatic cleaning device for use in an extracting furnace of an apparatus for analyzing gases in metals. 4,388,722, Cl. 373-118.000.

Tanimoto, Tetuyuki: *See*—
Yamazaki, Yasuo; Kimura, Kazuo; and Tanimoto, Tetuyuki, 4,387,967, Cl. 350-423.000.

Tao, Bernard Y.: *See*—
Lomneth, Richard B.; Blair, Daniel R.; Parnell, Gary L.; and Tao, Bernard Y., 4,388,339, Cl. 426-602.000.

Tarli, Paolo: *See*—
Cocola, Francesco; Tarli, Paolo; and Neri, Paolo, 4,388,295, Cl. 424-1.000.

Tataria, Harshad: *See*—
De Haan, Abel; and Tataria, Harshad, 4,388,380, Cl. 429-91.000.

Tatsuguchi, Kazuo, to Victor Company of Japan, Ltd. Rotation control system in a rotary recording medium reproducing apparatus. 4,388,713, Cl. 369-50.000.

Tauschinski, Stefan, to Eduard Fresenius Chemisch Pharmazeutische Industrie KG. Self-sealing connector for use with plastic cannulas and vessel catheters. 4,387,879, Cl. 251-149.100.

Tavasolian, Ali: *See*—
Hopper, Michael J.; Martin, Michael R.; Bolt, Lawrence; Smith, Michael; and Tavasolian, Ali, 4,388,375, Cl. 428-423.700.

Tawada, Yoshihisa: *See*—
Hamakawa, Yoshihiro; and Tawada, Yoshihisa, 4,388,482, Cl. 136-258.000.

Taylor, Leonard S., to United States of America, Navy. Flush mountable plasma density profile probe device. 4,388,588, Cl. 324-72.500.

TDK Electronics Co., Ltd.: *See*—
Kubota, Yuichi, 4,388,376, Cl. 428-425.900.
Shiba, Haruo, 4,387,823, Cl. 220-4.00R.
Tamai, Kiminori; and Hayama, Masashi, 4,388,369, Cl. 428-339.000.

Technische Gerate-u Entwicklungagesellschaft m.b.H.: *See*—
Jordan, Heinz, 4,387,867, Cl. 244-12.200.

Teijin Limited: *See*—
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, 4,388,243, Cl. 260-397.200.

Teledyne Still-Man Manufacturing: *See*—
Willbanks, Henry O.; and Johnson, Richard P., 4,388,518, Cl. 219-455.000.
Terabayashi, Gosaku: *See*—
Sarai, Hiroshi; and Terabayashi, Gosaku, 4,387,853, Cl. 239-284.00R.
Terao, Shinji; Shiraishi, Mitsuru; and Kato, Kaneyoshi, to Takeda Chemical Industries, Ltd. Quinone derivatives, their production and use. 4,388,312, Cl. 424-244.000.
Terasaki Denki Sangyo Kabushiki Kaisha: *See*—
Murai, Wasaburo; and Horikawa, Masao, 4,388,506, Cl. 200-144.00R.
Terauchi, Kazuo; and Fukata, Masatoshi, to Hitachi Shipbuilding & Engineering Co., Ltd. Device for engaging and disengaging cable. 4,387,659, Cl. 114-199.000.
Teschendorf, Hans-Juegen: *See*—
Steiner, Gerd; Franke, Albrecht; Lenke, Dieter; Teschendorf, Hans-Juegen; Worstmann, Wolfgang; and Kreiskott, Horst, 4,388,237, Cl. 260-239.0BC.
Test, Howard R., II; and Drury, Michael J., to Texas Instruments Incorporated. Data processing system having dual output modes. 4,388,696, Cl. 364-900.000.
Tetra Pak Developpement SA: *See*—
Ignell, Rolf L., 4,387,820, Cl. 215-320.000.
Tetra Pak Developpement S.A.: *See*—
Reil, Wilhelm, 4,387,547, Cl. 53-131.000.
Tetsuro, Oshimi, to Noritake, Co., Limited. Grinding machine assembly. 4,387,538, Cl. 51-35.000.
Texaco Inc.: *See*—
Lewis, Paul H.; Durkin, Joseph A.; and Froelich, Joseph A., 4,388,178, Cl. 208-115.000.
Lionetti, Thomas A.; and Schrader, Charles H., 4,388,175, Cl. 208-74.000.
Pratt, Roy E.; Sayles, Scott M.; Bowers, Kerry W.; and Scott, Richard P., deceased, 4,388,176, Cl. 208-80.000.
Valkovich, Phillip B.; and Hammond, Kenneth G., 4,388,200, Cl. 252-34.000.
Texas Instruments Incorporated: *See*—
Chiavaroli, Donald J., 4,387,690, Cl. 123-549.000.
Jones, James J.; and McIntosh, John O., 4,388,692, Cl. 364-557.000.
Marcoux, Leo; and Ting, Youn, 4,387,691, Cl. 123-557.000.
Rao, G. R. Mohan, 4,388,121, Cl. 148-1.500.
Schulte, Eric F.; and Porter, Vernon R., 4,388,517, Cl. 219-121.0LJ.
Test, Howard R., II; and Drury, Michael J., 4,388,696, Cl. 364-900.000.
Textieltechniek Haaksbergen B.V.: *See*—
Leuvelink, Gerrit W. E., 4,388,264, Cl. 264-281.000.
Textron Inc.: *See*—
Carey, Lee F., 4,387,564, Cl. 60-242.000.
Theodore, Frank W.: *See*—
Wasson, George E.; Theodore, Frank W.; Boyer, Lyndon D.; and Sooter, Matthew C., 4,388,152, Cl. 201-6.000.
Tholen, Paul, to Klockner-Humboldt Deutz Aktiengesellschaft. Light metal cylinder head for internal combustion engines. 4,387,678, Cl. 123-193.00H.
Thomas & Betts Corporation: *See*—
Haitmanek, Louis F., 4,387,949, Cl. 339-125.00R.
Thomas, Franz, to Christian, Pfeiffer. Swirling air centrifugal scatter classifier. 4,388,183, Cl. 209-139.00A.
Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Modular disinfector device. 4,388,521, Cl. 219-521.000.
Thomas, Thomas J.; and Hoquet, Robert G., to Mobay Chemical Corporation. Anthraquinone dyestuff modification. 4,388,078, Cl. 8-514.000.
Thomas, William L.: *See*—
Cox, Charles M.; and Thomas, William L., 4,388,645, Cl. 358-147.000.
Thompson, John K.: *See*—
Martin, Earl C.; Thompson, John K.; and Gargrave, Robert J., 4,387,583, Cl. 72-22.000.
Thompson, Quentin E.: *See*—
Robach, Michael C.; and Thompson, Quentin E., 4,388,321, Cl. 424-279.000.
Thomson-CSF: *See*—
Dehaene, Jean P., 4,388,726, Cl. 375-44.000.
Dupressoir, Albert, 4,388,624, Cl. 343-727.000.
Gautier, Herve; and Maerfeld, Charles, 4,388,599, Cl. 333-150.000.
Thye-Lokenberg, Heinrich. Pig box grating. 4,387,666, Cl. 119-28.000.
TII Industries Inc.: *See*—
Ahuja, Omprakash G., 4,388,501, Cl. 179-175.30R.
Tilley, Frederick H.: *See*—
Cooke, Jeremy C. R.; and Tilley, Frederick H., 4,387,652, Cl. 110-224.000.
Timbers, Gordon E.; Stark, Robert; Caron, Jacques C.; Cumming, Daniel B.; Cowmeadow, Richard R.; and Gingell, Alexander W., to Canadian Patents & Development Limited. Food processing with steam. 4,387,630, Cl. 99-348.000.
Timeplex, Inc.: *See*—
Heinemann, Joseph B., 4,388,695, Cl. 364-900.000.
Timm, Horst, to Blaupunkt-Werke GmbH. Combined electronic apparatus indicator and cassette tape transducer apparatus, particularly combined radio-recorder for automotive use. 4,388,712, Cl. 369-10.000.
Tindall, Melvyn Alan: *See*—
Cocker, Michael J., 4,387,917, Cl. 292-40.000.
Ting, Youn: *See*—
Marcoux, Leo; and Ting, Youn, 4,387,691, Cl. 123-557.000.
Tippmer, Kurt: *See*—
Rodewald, Bernhard; Tippmer, Kurt; and Tamm, Hans F., 4,388,172, Cl. 208-10.000.
Tipton, Joe D. Cyclonic separator-filter. 4,388,087, Cl. 55-96.000.
Tobiasz, Andre, to Societe Anonyme DBA. Hydraulic assisted steering device for a motor vehicle. 4,387,737, Cl. 137-625.210.
Toda, Haruhiko: *See*—
Suzuki, Shin-ichi; Kitoh, Shinya; Toda, Haruhiko; and Higo, Moriaki, 4,388,421, Cl. 523-118.000.
Toft, Mark A.: *See*—
Shore, Sheldon G.; and Toft, Mark A., 4,388,284, Cl. 423-295.000.
Tokarz, Richard D., to United States of America, Energy. Temperature profile detector. 4,388,267, Cl. 376-247.000.
Toki, Kenshiro: *See*—
Takao, Kengo; Ohmachi, Mineo; Kihara, Hisatsugu; Toki, Kenshiro; Tomita, Yukio; and Mizota, Toshihiro, 4,387,562, Cl. 60-39.150.
Tokyo Ohka Kogyo Kabushiki Kaisha: *See*—
Kanai, Wataru, 4,388,397, Cl. 430-197.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Enjoji, Susumu, 4,387,721, Cl. 128-660.000.
Kanuma, Akira, 4,388,537, Cl. 307-297.000.
Suzuki, Shuichi; Aizawa, Masuo; Koyama, Masao; Sato, Yuichi; and Koezuka, Junji, 4,388,166, Cl. 204-403.000.
Tsunekawa, Shou, 4,388,610, Cl. 382-8.000.
Ueno, Tsuyoshi; Mukai, Hideo; Nakatomi, Yoshitsugu; Saito, Hiroshi; Kinoshita, Koichi; and Konuma, Takaaki, 4,387,980, Cl. 355-3.0CH.
Tomita, Yukio: *See*—
Takao, Kengo; Ohmachi, Mineo; Kihara, Hisatsugu; Toki, Kenshiro; Tomita, Yukio; and Mizota, Toshihiro, 4,387,562, Cl. 60-39.150.
Tompkins, Russell E.: *See*—
Honsinger, Vernon B.; and Tompkins, Russell E., 4,388,545, Cl. 310-156.000.
Toray Silicone Company, Ltd.: *See*—
Ona, Isao, 4,388,437, Cl. 524-588.000.
Torban, Samuil S.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.
Torii, Takahiro; and Senoh, Hideaki, to Mitsubishi Paper Mills, Ltd. No-carbon copying paper. 4,387,913, Cl. 282-27.500.
Torin Corporation: *See*—
Cavagnero, Erman V.; and Waligura, Stanley M., 4,387,585, Cl. 72-131.000.
Toshiba Electric Equipment Corporation: *See*—
Koshimura, Yasunobu; Kobayashi, Hisao; and Aoike, Nanjou, 4,388,561, Cl. 315-171.000.
Sato, Koji; and Kaneko, Tadahiro, 4,388,676, Cl. 362-260.000.
Yamazaki, Kyoji; and Kamiya, Fumio, 4,388,567, Cl. 315-291.000.
Toy, Lester T.; Moyer, Wendell W.; Lyons, Bernard J.; and Horsma, David A., to Raychem Corporation. Conductive polymer compositions, and to devices comprising such compositions. 4,388,607, Cl. 338-22.0SD.
Toyo Ink Manufacturing Co., Ltd.: *See*—
Nishikawa, Syuzi; Matsubara, Toru; Iida, Kazuyoshi; and Tahara, Seiichiro, 4,388,427, Cl. 523-500.000.
Toyo Kogyo Co., Ltd.: *See*—
Ikemizu, Naoyuki, 4,388,355, Cl. 428-31.000.
Toyo Kohan Company, Ltd.: *See*—
Inui, Tsuneo; Kuroda, Hitoshi; Hanabusa, Tetsuro; and Yazaki, Katsuhito, 4,388,158, Cl. 204-27.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Kitamura, Yoichi; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,387,830, Cl. 220-456.000.
Kubo, Tateo, 4,388,058, Cl. 425-110.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Imamura, Noriaki, 4,387,792, Cl. 188-328.000.
Kaji, Kiyokane, 4,387,588, Cl. 73-35.000.
Katagiri, Masayoshi; and Ogura, Osamu, 4,387,625, Cl. 91-369.00B.
Miyagi, Hideo; and Nagase, Masaomi, 4,387,682, Cl. 123-339.000.
Mizuno, Tooru; and Hagisato, Yasuo, 4,388,558, Cl. 315-77.000.
Moriya, Shigeru; Yoshida, Akio; Tanaka, Koichi; and Nishimura, Yuji, 4,387,912, Cl. 280-804.000.
Sarai, Hiroshi; and Terabayashi, Gosaku, 4,387,853, Cl. 239-284.00R.
Suganuma, Tetsuya; Fuwa, Yoshio; Fujita, Shuichi; and Takahashij Yoshitaka, 4,388,114, Cl. 75-243.000.
Yasumatsu, Jun; Tsuge, Hiroshi; and Kawaharazaki, Takashi, 4,387,790, Cl. 188-65.300.
Transnuklear GmbH: *See*—
Knackstedt, Hans-Gunther; Muller, Erhard; Christ, Richard; and Kroll, Hartmut, 4,388,268, Cl. 376-272.000.
Travnicek, Mojmir: *See*—
Hynst, Karel; and Travnicek, Mojmir, 4,387,646, Cl. 101-350.000.
Trevex Corporation: *See*—
Preiss, Gunther W. B., 4,388,043, Cl. 417-36.000.

Trevino-Alanis, Asdrubal: *See—*
Carrillo-Cantu, David H.; and Trevino-Alanis, Asdrubal, 4,388,116, Cl. 106-97.000.
Triffterer, Adolf: *See—*
Bartel, Gunter; Patz, Eckhard; Koch, Karl; Stern, Georg; Stotz, Manfred; and Triffterer, Adolf, 4,388,053, Cl. 417-542.000.
Trio Kabushiki Kaisha: *See—*
Miyamoto, Yukihiko, 4,388,496, Cl. 179-1.0GS.
Triumph-Adler A.G. fur Buro- und Informationstechnik: *See—*
Meier, Heinz; and Zurawski, Egon, 4,388,007, Cl. 400-314.000.
Trouet, Andre B. L.; Hannart, Jean A. A. J.; and Rao, Kandukuri S. B., to Omnichem S.A. Vinblastin-23-oyl amino acid derivatives for use as antitumor agents. 4,388,305, Cl. 424-177.000.
True Temper Corporation: *See—*
Luebke, Robert W., 4,388,357, Cl. 428-57.000.
Trybulski, Eugene J., to Hoffmann-La Roche Inc. Production of 1-halophenyl and 1-phenyl-3,4-dihydro-5H-2-benzazepine-5-ones. 4,388,239, Cl. 260-239.0BB.
Tsai, James T.: *See—*
Codispoti, Thomas E.; Giustino, James M.; Griffith, Richard M.; and Tsai, James T., 4,388,261, Cl. 264-171.000.
Tschan, J. Donald; and Hatton, Clifford P., to P. H. Bowman Co., Inc. Anchor bracket. 4,387,543, Cl. 52-295.000.
Tseng, Eric S.: *See—*
Basol, Bulent M.; Tseng, Eric S.; and Rod, Robert L., 4,388,483, Cl. 136-260.000.
TSI Incorporated: *See—*
Adrian, Ronald J., 4,387,993, Cl. 356-336.000.
Tsuboi, Masayoshi, to Fuji Photo Film Co., Ltd. Process for forming color images. 4,388,387, Cl. 430-7.000.
Tsubuko, Kazuo; Hashimoto, Junichiro; Kuramoto, Shinichi; and Okawara, Makoto, to Ricoh Co., Ltd. Liquid developer for use in electrophotography. 4,388,395, Cl. 430-114.000.
Tsuchida, Takayasu: *See—*
Sano, Kounosuke; and Tsuchida, Takayasu, 4,388,405, Cl. 435-107.000.
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, to Olympus Optical Company Limited. Manuscript feed device for an electrophotographic apparatus. 4,387,986, Cl. 355-75.000.
Tsuda, Takeshi: *See—*
Kudoh, Akihide; Kawamata, Motoo; Ohshima, Kazushi; Kotani, Makoto; Tsuda, Takeshi; and Aoki, Fukuichi, 4,388,478, Cl. 568-804.000.
Tsuge, Hiroshi: *See—*
Yasumatsu, Jun; Tsuge, Hiroshi; and Kawaharazaki, Takashi, 4,387,790, Cl. 188-65.300.
Tsuji, Katsuyuki: *See—*
Tsunetomi, Katashi; Takahashi, Akira; and Tsuji, Katsuyuki, 4,387,680, Cl. 123-198.00F.
Tsumura, Sukebumi: *See—*
Awazuhara, Hiroshi; Tsumura, Sukebumi; and Kimura, Tomoaki, 4,387,586, Cl. 72-206.000.
Tsunekawa, Shou, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for reading drawings. 4,388,610, Cl. 382-8.000.
Tsunetomi, Katashi; Takahashi, Akira; and Tsuji, Katsuyuki. Mechanism for stopping valve operation. 4,387,680, Cl. 123-198.00F.
Tsuruta, Hideki: *See—*
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, 4,388,243, Cl. 260-397.200.
Turk, Roger R.; and Robinson, Morton, to Hughes Aircraft Company. Hot-pressed fluoride glasses. 4,388,097, Cl. 65-64.000.
Turner, Rudolf: *See—*
Cox, Charles M.; and Turner, Rudolf, 4,388,639, Cl. 358-27.000.
Turner, Wheeler M. Reading and viewing lamp. 4,388,678, Cl. 362-293.000.
Turnwald, Ernst: *See—*
Dresler, Helmut; and Turnwald, Ernst, 4,388,051, Cl. 417-505.000.
Tutt, Kingsley J.: *See—*
Reedman, David C.; and Tutt, Kingsley J., 4,387,581, Cl. 69-6.500.
Twibell, Jerome J.; and Johnston, Robert J., to Honeywell Information Systems Inc. Memory unit. 4,388,687, Cl. 364-200.000.
Tyer, Robert C., to Rockland Manufacturing Co., Inc. Tree shearing apparatus. 4,387,752, Cl. 144-34.00E.
Tyers, G. Frank O.: *See—*
Brownlee, Robert R.; Hughes, Howard C., Jr.; Neff, Paul H.; and Tyers, G. Frank O., 4,387,717, Cl. 128-419.0PG.
Tytell, Alfred A.: *See—*
Field, A. Kirk; Tytell, Alfred A.; and Lampson, George P., 4,388,306, Cl. 424-177.000.
U.S.D. Corp: *See—*
Kranz, Max L., 4,387,600, Cl. 73-714.000.
Uchida, Kenji: *See—*
Sakamoto, Masakatsu; Uchida, Kenji; and Nagano, Shuichi, 4,387,595, Cl. 73-322.500.
Uchidoi, Masanori; Aizawa, Hiroshi; Urushihara, Kazunobu; Suzuki, Nobuyuki; and Shimizu, Masami, to Canon Kabushiki Kaisha. Power supply device for camera. 4,387,977, Cl. 354-60.00R.
Uchikawa, Fusaoki, to Mitsubishi Denki Kabushiki Kaisha. Tar inhibitor coated layer. 4,388,377, Cl. 428-446.000.
Uchiyama, Hiroshi, to E. C. Chemical Ind. Co., Ltd.; and C. Itoh & Co., Ltd. Dibenzylidene sorbitol composition and process for preparation thereof. 4,388,119, Cl. 106-316.000.
Uematsu, Ikuzo: *See—*
Nakahara, Teiji; Morihashi, Toshifumi; Nakayama, Teruo; Nishimura, Shinichi; Kato, Hisaaki; Uematsu, Ikuzo; and Yoshioka, Takashi, 4,387,487, Cl. 19-249.000.
Uemura, Koichi; and Uemura, Makoto, to Uemura, Koichi. Method and apparatus for advancing cylindrical bodies underground. 4,388,020, Cl. 405-138.000.
Uemura, Makoto: *See—*
Uemura, Koichi; and Uemura, Makoto, 4,388,020, Cl. 405-138.000.
Ueno, Hiroshi: *See—*
Kitamura, Yoichi; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,387,830, Cl. 220-456.000.
Ueno, Tsuyoshi; Mukai, Hideo; Nakatomi, Yoshitsugu; Saito, Hiroshi; Kinoshita, Koichi; and Konuma, Takaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Charging device for electronic copier. 4,387,980, Cl. 355-3.0CH.
Ueyanagi, Kaoru; Ide, Akira; Kato, Masaaki; and Komatsu, Kazuro, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing organic polyisocyanate compositions. 4,388,245, Cl. 260-453.0AB.
Ufermann, Werner, to G. Siempelkamp GmbH & Co. Mat-forming apparatus. 4,388,055, Cl. 425-80.100.
Uhlmann, Georg, to Rheintechnik, Weiland & Kaspar KG. Apparatus for use in livestock obstetrics. 4,387,716, Cl. 128-352.000.
Ullmann, Roland; and Zimmermann, Klaus, to Braun AG. Synthetic-resin and metallic layered housing for hand-held appliance. 4,388,509, Cl. 200-157.000.
Umemura, Yoshifumi: *See—*
Suzuki, Hajime; Umemura, Yoshifumi; and Kimbara, Masahiko, 4,387,743, Cl. 139-110.000.
Umezawa, Michio, to Ricoh Co., Ltd. Ink-jet printing head. 4,388,627, Cl. 346-75.000.
Unger, John C.; Schwartz, Sidney J.; and Chow, Ling G., to Burroughs Corporation. Method of fabricating magnets. 4,388,131, Cl. 156-89.000.
Union Oil Company of California: *See—*
Moorehead, Eric L., 4,388,221, Cl. 252-435.000.
Moorehead, Eric L., 4,388,224, Cl. 252-455.00Z.
Union Tank Car: *See—*
Green, Daniel R., 4,388,026, Cl. 406-130.000.
Uniroyal Englebert Reifen GmbH: *See—*
Mirtain, Henri J.; and Zinnen, Norbert, 4,387,754, Cl. 152-209.00R.
United Kingdom Atomic Energy Authority: *See—*
Wright, Christopher J., 4,388,277, Cl. 422-211.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Brint, Norman T.; and Williams, Leon J., 4,387,524, Cl. 42-18.000.
United States Gypsum Company: *See—*
House, Cynthia B.; and Leichti, Robert J., 4,388,378, Cl. 428-537.000.
Palmer, Jay W.; and Gaynor, John C., 4,388,292, Cl. 423-555.000.
United States of America
Agriculture: *See—*
Biller, Cleveland J.; and Johnson, David D., 4,387,812, Cl. 212-176.000.
Nazerian, Keyvan; and Fadly, Aly M., 4,388,298, Cl. 424-89.000.
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Walton, Charles A. Electronic identification and recognition system with code changeable reactance. 4,388,524, Cl. 235-380.000.
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Weber, Thomas, to Klockner-Humboldt-Deutz Aktiengesellschaft. Rotor for turbo engines. 4,388,042, Cl. 416-198.00A.
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Weidner, Peter; and Wich, Harald, to Diehl GmbH & Co. Electrical projectile detonator. 4,387,649, Cl. 102-215.000.
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Sawyer, Ernest W., 4,388,351, Cl. 427-304.000.
Wyatt, Kenneth L., 4,387,508, Cl. 29-738.000.
Westernacher, Helmut; and Schamann, Franz, deceased (by Schamann, Elfriede, Ilka Schamann, heirs), to GAF Huls Chemie GmbH. Regenerating heavy metal catalysts for butynediol production. 4,388,216, Cl. 252-412.000.
Westhoff, James A.: *See*—
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Zalewski, Gerald F., 4,387,481, Cl. 15-316.00R.
White, Harlan V., to Mechanical Technology Incorporated. Heat engine device. 4,387,567, Cl. 60-520.000.
White, Hugh L. Can filling nozzle head. 4,387,748, Cl. 141-57.000.
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Wiese, Kurt: *See*—
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Wigan, Jack G.; Ure, David G.; and Richards, John M., to Reuters Limited. Conversational video system. 4,388,489, Cl. 178-3.000.
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Wiles, Laurence E.; Page, Frank C., III; and Eibensteiner, Bruno A., to Ethyl Products Company; and Mr. John F. Sieberth. Child resistant container cover. 4,387,817, Cl. 215-217.000.
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Feller, Murray F., 4,388,003, Cl. 374-41.000.
Wilhelm, Donald C. Alpha numeric character arrangement. 4,387,521, Cl. 40-107.000.
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Willbanks, Henry O.; and Johnson, Richard P., to Teledyne Still-Man Manufacturing. Electric surface heater assembly. 4,388,518, Cl. 219-455.000.
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Williams, John W.: *See*—
Gutman, Arnold D.; and Williams, John W., 4,388,249, Cl. 260-465.00F.
Williams, Joseph R.: *See*—
Keller, Alex J.; Williams, Joseph R.; Fechner, Erhard A.; and Pinto, Akiva, 4,387,486, Cl. 19-105.000.
Williams, Leon J.: *See*—
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Willing, Robert: *See*—
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Willis, Clive: *See*—
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Wilson, Eddie K., Sr. Process and apparatus for producing portland and other hydraulic cements. 4,388,117, Cl. 106-100.000.

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Winger, Paul: *See*—
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Brownawell, Darrell W.; Shaub, Harold; Wisotsky, Max J.; and Gutierrez, Antonio, 4,388,201, Cl. 252-49.600.

Witkiewicz, Ronald F.: *See*—
Kennell, Samuel C.; and Witkiewicz, Ronald F., 4,388,424, Cl. 523-219.000.

Wittenborg, Poul E., to A/S Wittenborgs Automatfabriker. Method for preparing beverages in portions. 4,388,338, Cl. 426-590.000.

Wicek, Rudolf; and Kunze, Dieter, to Siemens Aktiengesellschaft. Sealing system for a longitudinally divided cable fitting element. 4,388,488, Cl. 174-92.000.

Wlodkowski, Johann; and Jungwirth, Dieter, to Dyckerhoff & Widmann Aktiengesellschaft. Multiple part tapered collar for a tendon anchorage system. 4,388,014, Cl. 403-369.000.

Wobben, Hendrik J.; and Tan, Hian-Bie, to Naarden International N.V. Process for the preparation of citrus juice containing beverages with improved cloud stability. 4,388,330, Cl. 426-51.000.

Wohrl, Josef. Fluid weighing device and method for its callibration and testing. 4,387,778, Cl. 177-207.000.

Woitun, Eberhard: *See*—
Wetzel, Bernd; Woitun, Eberhard; Maier, Roland; Reuter, Wolfgang; Lechner, Uwe; and Goeth, Hanns, 4,388,315, Cl. 424-246.000.

Wolf, Rainer: *See*—
Mauric, Claudine; and Wolf, Rainer, 4,388,431, Cl. 524-119.000.

Wollenberg, Robert H., to Chevron Research Company. Process for the preparation of alkenyl succinic anhydrides. 4,388,471, Cl. 549-255.000.

Wong, Jon H., to Rockwell International Corporation. Cam master spider identifier. 4,387,511, Cl. 33-1.0BB.

Wood, Harold F.: *See*—
Greene, Jay R.; Windecker, James W., Jr.; Roberts, James H.; and Wood, Harold F., 4,388,008, Cl. 400-578.000.

Wood, Obert R., II: *See*—
Silfvast, William T.; Szeto, Leo H.; and Wood, Obert R., II, 4,388,720, Cl. 372-76.000.

Woodhull, Bradley A.: *See*—
Richardson, Neil R.; and Woodhull, Bradley A., 4,387,572, Cl. 60-602.000.

Woodman, Daniel W., Jr.: *See*—
Wright, Henry L.; Bandura, Vitaly; and Woodman, Daniel W., Jr., 4,387,506, Cl. 29-714.000.

Worstmann, Wolfgang: *See*—
Steiner, Gerd; Franke, Albrecht; Lenke, Dieter; Teschendorf, Hans-Juegen; Worstmann, Wolfgang; and Kreiskott, Horst, 4,388,237, Cl. 260-239.0BC.

Wright, Christopher J., to United Kingdom Atomic Energy Authority. Catalyst device and method. 4,388,277, Cl. 422-211.000.

Wright, Henry L.; Bandura, Vitaly; and Woodman, Daniel W., Jr., to USM Corporation. Component inserting machine. 4,387,506, Cl. 29-714.000.

Wyatt, Kenneth L., to Western Electric Company, Inc. Apparatus for magnetically assembling fragile parts. 4,387,508, Cl. 29-738.000.

Wynn, Michael J.: *See*—
West, Jon K.; Catotti, Arthur J.; and Wynn, Michael J., 4,388,120, Cl. 134-15.000.

Xerox Corporation: *See*—
Brueggemann, Harry P., 4,387,970, Cl. 350-463.000.
Chen, Tu; and Cavallotti, Pietro L., 4,388,367, Cl. 428-323.000.
Hawkins, William G.; and Black, Jerry G., 4,388,145, Cl. 156-617.00R.
Rourke, John L.; Azar, Jack C.; and Murphy, William K., 4,388,274, Cl. 422-177.000.
Stanley, Michael R., 4,387,982, Cl. 355-3.0DD.

Yabusaki, Kenichi K., to Hana Biologics, Inc. Immunoassay of phospholipid, such as phosphatidylcholine, in fluids such as amniotic. 4,388,412, Cl. 436-536.000.

Yagihara, Morio: *See*—
Morigaki, Masakazu; Yagihara, Morio; and Ozawa, Takashi, 4,388,404, Cl. 430-548.000.

Yahano, Kanji: *See*—
Nagira, Norichika; Ikegami, Hiroshi; Baba, Hiroji; and Yahano, Kanji, 4,388,169, Cl. 204-207.000.

Yahrmarkt, Richard A.; and Stanbrough, Michael J., to Nalco Chemical Company. Process for producing pulp. 4,388,148, Cl. 162-26.000.

Yamada, Mitsuhiko, to Dainippon Screen Seizo Kabushiki Kaisha. Method for controlling writing timings of picture signals to be stored in a memory. 4,388,653, Cl. 358-302.000.

Yamagata, Ryutaro: *See*—
Koyama, Shigeo; Yamagata, Ryutaro; Kozuka, Nobuhiko; and Sakata, Hiromi, 4,387,889, Cl. 271-10.000.

Yamaguchi, Kojirou: *See*—
Obata, Kazuo; Yamaguchi, Yutaka; Yamaguchi, Kojirou; and Sato, Akio, 4,387,759, Cl. 152-353.00R.

Yamaguchi, Yutaka: *See*—
Obata, Kazuo; Yamaguchi, Yutaka; Yamaguchi, Kojirou; and Sato, Akio, 4,387,759, Cl. 152-353.00R.

Yamamoto, Setsuo; and Ushiyama, Yasuichi, to Nippon Electric Co., Ltd. Centering unit for a color television camera apparatus having plural pick-up tubes. 4,388,641, Cl. 358-51.000.

Yamanishi, Toru: *See*—
Kimura, Takao; and Yamanishi, Toru, 4,388,093, Cl. 65-3.110.

Yamashita, Noriyuki, to Sony Corporation. Frequency controlled signal generating circuit. 4,388,596, Cl. 331-1.00A.

Yamasita, Nobuo: *See*—
Nishioka, Kimihiko; and Yamasita, Nobuo, 4,387,969, Cl. 350-462.000.

Yamazaki, Kyoji; and Kamiya, Fumio, to Toshiba Electric Equipment Corporation. Remote lighting-control apparatus. 4,388,567, Cl. 315-291.000.

Yamazaki, Yasuo; Kimura, Kazuo; and Tanimoto, Tetuyuki, to Minolta Camera Co., Ltd. Optical system for use in single lens reflex cameras. 4,387,967, Cl. 350-423.000.

Yancey, Irvin R.: *See*—
Gentry, Larry L.; Moss, Herbert H.; Panicker, Narayana N.; Wada, William T.; and Yancey, Irvin R., 4,388,022, Cl. 405-195.000.

Yaroshenko, Jury F.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa I.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.

Yasuda, Yoshiko: *See*—
Ogawa, Kazufumi; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, 4,388,128, Cl. 156-64.000.

Yasumatsu, Jun; Tsuge, Hiroshi; and Kawaharazaki, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing locking device. 4,387,790, Cl. 188-65.300.

Yates, George, Jr. Plastic container and lid. 4,387,828, Cl. 220-284.000.

Yatsuo, Tsutomu: *See*—
Watanabe, Atsuo; Naito, Masayoshi; Yatsuo, Tsutomu; and Okamura, Masahiro, 4,388,635, Cl. 357-38.000.

Yazaki, Katsuhito: *See*—
Inui, Tsuneo; Kuroda, Hitoshi; Hanabusa, Tetsuro; and Yazaki, Katsuhito, 4,388,158, Cl. 204-27.000.

Yazawa, Kenichiro; Kitajima, Masao; and Kondo, Asaji, to Fuji Photo Film Co. Ltd. Chemical analysis slide frame assembly. 4,387,990, Cl. 356-244.000.

Yen, Duen H.: *See*—
Nash, Donald H.; and Yen, Duen H., 4,388,730, Cl. 455-208.000.

Yogo, Kenji; and Nomura, Isshi, to Aisin Seiki Kabushiki Kaisha. Electromagnetically controlled fuel injection system. 4,387,696, Cl. 123-585.000.

Yokohama Rubber Co., Ltd., The: *See*—
Kato, Masaki; Morikawa, Tuneo; and Kabe, Kazuyuki, 4,387,755, Cl. 152-209.00R.

Yokoyama, Shigeki: *See*—
Mukunoki, Yasuo; Nakayama, Yasuhiro; and Yokoyama, Shigeki, 4,388,402, Cl. 430-527.000.

Yoneda, Kenji: *See*—
Katsumata, Masaaki; and Yoneda, Kenji, 4,387,571, Cl. 60-602.000.

Yonezawa, Taketoshi: *See*—
Ogawa, Kazufumi; Kondo, Shigeru; Yasuda, Yoshiko; Yonezawa, Taketoshi; and Kitahiro, Isamu, 4,388,128, Cl. 156-64.000.

Yonezawa Toys Co., Ltd.: *See*—
Okamoto, Shozo, 4,388,036, Cl. 414-537.000.

Yong, Samuel H.; Anderson, George R.; and Levin, Liza, to Pillsbury Company, The. Dough product containing an organic acid leavener. 4,388,336, Cl. 426-551.000.

York, Gerald O. Oil field mats. 4,388,484, Cl. 174-5.00R.

York, Lawrence R.: *See*—
de Figueiredo, Mario P.; Guevara, Balagtas F.; Long, James L.; Morgan, Ronnie G.; and York, Lawrence R., 4,388,340, Cl. 426-614.000.

Yoshiba, Yasutaka; and Shiobara, Masaji, to Nissan Motor Co., Ltd. EGR Control system for diesel engine. 4,387,694, Cl. 123-571.000.

Yoshida, Akio: *See*—
Moriya, Shigeru; Yoshida, Akio; Tanaka, Koichi; and Nishimura, Yuji, 4,387,912, Cl. 280-804.000.
Yoshida, Hiroyuki: *See*—
Sakurada, Kenichi; Yoshida, Hiroyuki; and Ozaki, Tadahiko, 4,387,862, Cl. 242-107.600.
Yoshida Industry Co., Ltd.: *See*—
Shioi, Yuji, 4,387,730, Cl. 132-83.00R.
Yoshida Kogyo K.K.: *See*—
Kanzaka, Yoshihiro, 4,387,488, Cl. 24-113.00R.
Morioka, Koitsu, 4,387,495, Cl. 29-408.000.
Yoshida, Satoshi: *See*—
Tabei, Masatoshi; Wada, Minoru; Takahashi, Yonosuke; and Yoshida, Satoshi, 4,388,400, Cl. 430-346.000.
Yoshioka, Takashi: *See*—
Nakahara, Teiji; Morihashi, Toshifumi; Nakayama, Teruo; Nishimura, Shinichi; Kato, Hisaaki; Uematsu, Ikuzo; and Yoshioka, Takashi, 4,387,487, Cl. 19-249.000.
Young, Terry A.; Mann, William W.; Kline, Charles M.; and Schoeneberger, Ernest A., to Sperry Corporation. Grinder-mixer controls. 4,387,857, Cl. 241-101.00B.
Yui, Tomoyuki: *See*—
Sugano, Junichiro; Yui, Tomoyuki; Minamikawa, Yoshitugu; and Fujimoto, Tsuneo, 4,388,287, Cl. 423-415.00P.
Yuyama, Yukihiro: *See*—
Iwata, Susumu; Maruta, Keiichi; and Yuyama, Yukihiro, 4,388,362, Cl. 428-211.000.
YWHC, Inc.: *See*—
Hetz, Heinz K., 4,387,732, Cl. 137-183.000.
Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Schneider, Rudolf; and Winkelmann, Siegfried, 4,387,794, Cl. 192-18.00B.
Zalewski, Gerald F., to White Consolidated Industries, Inc. Soot blower. 4,387,481, Cl. 15-316.00R.
Zartman, David L., to New Mexico State University Foundation, Inc. Method for remotely monitoring the long term deep body temperature in female mammals. 4,387,724, Cl. 128-736.000.
Zeidler, Guenter; Lange, Gerhard; and Saller, Helmut, to Siemens Aktiengesellschaft. Longitudinally water-tight cables and method of producing the same. 4,387,958, Cl. 350-96.230.
Zeidler, Guenter; Ney, Ernst; Lange, Gerhard; and Saller, Helmut, to Siemens Aktiengesellschaft. Longitudinally water-tight cables. 4,388,485, Cl. 174-23.00C.
Zenith Radio Corporation: *See*—
Cox, Charles M.; and Turner, Rudolf, 4,388,639, Cl. 358-27.000.
Cox, Charles M.; and Thomas, William L., 4,388,645, Cl. 358-147.000.
Lange, Howard G.; and Schulman, Ronald, 4,387,959, Cl. 350-128.000.
Lostumo, Arthur J.; and Pulchinski, Steven J., 4,387,947, Cl. 339-90.00R.
Ray, Francis M., 4,388,551, Cl. 313-346.00R.
Reno, James J., Jr.; and Schmid, Richard G., 4,388,642, Cl. 358-60.000.
Zenzefilis, George E. Method and apparatus for recording and reproducing video and sound. 4,388,655, Cl. 360-19.100.
Zhislin, Yakov M.: *See*—
Grinberg, Efim N.; Braginsky, Yakov I.; Zhislin, Yakov M.; Lavrov, Vladimir V.; Mitrofanov, Viktor A.; Nikitushkin, Nikolai A.; Filatov, Alexandr A.; Yaroshenko, Jury F.; Torban, Samuil S.; Kovalev, Viktor M.; Urusov, Georgy I.; Rozanova, Alla V.; Radakova, Tatyana N.; Krivosheina, Larisa L.; Bykov, Vladimir P.; Bykova, Vladimira M.; and Gultsev, Igor V., 4,387,485, Cl. 17-48.000.
Zimmermann, Klaus: *See*—
Ullmann, Roland; and Zimmermann, Klaus, 4,388,509, Cl. 200-157.000.
Zinnen, Norbert: *See*—
Mirtain, Henri J.; and Zinnen, Norbert, 4,387,754, Cl. 152-209.00R.
Zodrow, Rudolf: *See*—
Buchholz, Rainer; Mohn, Hans-Werner; Boms, Hermann; and Zodrow, Rudolf, 4,388,143, Cl. 156-475.000.
Zukausky, Keith E., to Eaton Corporation. Pilot operated valve assembly. 4,387,878, Cl. 251-30.000.
Zurawski, Egon: *See*—
Meier, Heinz; and Zurawski, Egon, 4,388,007, Cl. 400-314.000.
ZVS-Adamovske strojirny, koncernovy podnik: *See*—
Hynst, Karel; and Travnicek, Mojmir, 4,387,646, Cl. 101-350.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF JUNE, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Appel, Douglas C.: *See*—
Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., Re. 31,274, Cl. 165-95.000.

Arnot, Larry K.: *See*—
Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., Re. 31,274, Cl. 165-95.000.

Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., to Wynn Oil Company. Engine cooling system flushing apparatus and method. Re. 31,274, Cl. 165-95.000.

Branick Mfg. Co.: *See*—
Peterson, Harold S., Re. 31,273, Cl. 157-1.100.

Gabriel, Anthony P.; and Justiss, Jimmy, to General Cable Corporation. Telephone cable with improved shield combination. Re. 31,277, Cl. 174-36.000.

General Cable Corporation: *See*—
Gabriel, Anthony P.; and Justiss, Jimmy, Re. 31,277, Cl. 174-36.000.

Hobart, James L.: *See*—
Mefferd, Wayne S.; and Hobart, James L., Re. 31,279, Cl. 372-107.000.

Ingersoll-Rand Company: *See*—
Schlage, Ernest L., Re. 31,276, Cl. 292-340.000.

Justiss, Jimmy: *See*—
Gabriel, Anthony P.; and Justiss, Jimmy, Re. 31,277, Cl. 174-36.000.

Lockheed Corporation: *See*—
Wirt, Leslie S., Re. 31,275, Cl. 181-224.000.

Mefferd, Wayne S.; and Hobart, James L. Laser optical resonator. Re. 31,279, Cl. 372-107.000.

Papst Motoren GmbH & Co., KG: *See*—
Schmider, Fritz, Re. 31,278, Cl. 310-268.000.

Peterson, Harold S., to Branick Mfg. Co. Curing rim. Re. 31,273, Cl. 157-1.100.

Pevsner, Paul H. Catheter delivery system and method. Re. 31,272, Cl. 604-28.000.

Schlage, Ernest L., to Ingersoll-Rand Company. Lock strike construction. Re. 31,276, Cl. 292-340.000.

Schmider, Fritz, to Papst Motoren GmbH & Co., KG. Brushless D-C motor. Re. 31,278, Cl. 310-268.000.

Wirt, Leslie S., to Lockheed Corporation. Zeno duct sound attenuating means. Re. 31,275, Cl. 181-224.000.

Wynn Oil Company: *See*—
Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., Re. 31,274, Cl. 165-95.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Kohayakawa, Yoshimi; and Matsumura, Isao, to Canon Kabushiki Kaisha. Method and device for detecting distance between eye-examining instrument and eye. B1 4,196,979, Cl. 351—208.

Canon Kabushiki Kaisha: *See*—
Kohayakawa, Yoshimi; and Matsumura, Isao. B1 4,196,979, Cl. 351—208.

Verheyden, Julien P.; and Martin, John C., to Syntex (U.S.A.) Inc. 9-(1,3-dihydroxy-2-propoxymethyl)-guanine as antiviral agent. B1 4,355,032, Cl. 424—253.

Syntex (U.S.A.) Inc.: *See*—
Verheyden, Julien P.; and Martin, John C. B1 4,355,032, Cl. 424—253.

Golben, Michael, to Minnesota Mining and Manufacturing Company. Process of plating metal objects. B1 3,400,012, Cl. 427—242.

Minnesota Mining and Manufacturing Company: *See*—
Golben, Michael, B1 3,400,012, Cl. 427—242.

LIST OF DESIGN PATENTEES

AB Akerlund & Rausing: *See*—
Linner, Hans R. I., 269,325, Cl. D9-433.000.
Linner, Hans R. I., 269,326, Cl. D9-433.000.

Abe, Masaru: *See*—
Maeda, Muneyoshi; Kojima, Hiroshi; and Abe, Masaru, 269,337, Cl. D12-146.000.

AGFA-Gevaert AG: *See*—
Lermann, Peter; and Schultheiss, Karl-Heinz, 269,350, Cl. D16-14.000.

Alton Packaging Corporation: *See*—
Klein, Kenneth W., 269,324, Cl. D9-433.000.

Barlow, Gordon A., to Gordon Barlow Design. Ball game housing. 269,358, 6-14-83, Cl. D21-9.000.

Bateman, Robert F.: *See*—
Swett, James B.; Bateman, Robert F.; and Boucher, Richard A., 269,313, Cl. D7-3.000.

Belt, Kenneth W.; and Congdon, George L., to Norland Corporation. Cardiac pacer. 269,373, 6-14-83, Cl. D24-17.000.

Belter, Robert H., to Slautterback Corporation. Combined melter and dispenser for thermoplastic material. 269,349, 6-14-83, Cl. D15-144.000.

Beltram, J. Richard: *See*—
Cantatore, Louis; and Beltram, J. Richard, 269,347, Cl. D7-383.000.

Blair, Thomas O. Device for setting fabric loops. 269,330, 6-14-83, Cl. D10-64.000.

Blanchard, Curtis R., to General Housewares Corp. Microwave tea kettle. 269,318, 6-14-83, Cl. D7-312.000.

Bledsoe, Gary R., to Medical Designs, Inc. Articulate knee brace. 269,379, 6-14-83, Cl. D24-64.000.

Boeing Company, The: *See*—
Harold, William M.; and Robinson, Ronald H., 269,340, Cl. D12-319.000.

Boucher, Richard A.: *See*—
Swett, James B.; Bateman, Robert F.; and Boucher, Richard A., 269,313, Cl. D7-3.000.

Bridgestone Tire Company Limited: *See*—
Kojima, Hiroshi; Nishio, Hideaki; and Yamauchi, Makoto, 269,338, Cl. D12-147.000.
Maeda, Muneyoshi; Kojima, Hiroshi; and Abe, Masaru, 269,337, Cl. D12-146.000.

Brown, James B. Ammonia inhalant package. 269,374, 6-14-83, Cl. D24-34.000.

Bunger, Richard E. Interlocking flume platform panel for animal confinement pens. 269,384, 6-14-83, Cl. D30-2.000.

Bunger, Richard E. Interlocking flume platform panel for animal confinement pens. 269,385, 6-14-83, Cl. D30-2.000.

Canon Kabushiki Kaisha: *See*—
Yoshioka, Eiichi; Suwa, Kaname; and Ishiwatari, Masumi, 269,356, Cl. D18-7.000.

Cantatore, Louis; and Beltram, J. Richard, to International Edge Tool Co. Food slicer. 269,347, 6-14-83, Cl. D7-383.000.

Castro, Robert J. Archery rack or the like. 269,311, 6-14-83, Cl. D6-129.000.

Cervantes, Rafael T., to Westbury Foundation, The; and Sociedad de Dispositivos Reductores de Tabaco, S.A. Cigar and cigarette filter perforator. 269,381, 6-14-83, Cl. D27-51.000.

Cervantes, Rafael T., to Westbury Foundation, The; and Sociedad de Dispositivos Reductores de Tabaco, S.A. Cigar and cigarette filter perforator. 269,382, 6-14-83, Cl. D27-51.000.

Cervantes, Rafael T., to Westbury Foundation, The; and Sociedad de Dispositivos Reductores de Tabaco, S.A. Cigar and cigarette filter perforator. 269,383, 6-14-83, Cl. D27-51.000.

Cesaroni, William: *See*—
Gremonprez, Dan E.; Painter, David L.; and Cesaroni, William, 269,320, Cl. D7-360.000.

Cheung, Michael, to Promoters Ltd. Clock. 269,328, 6-14-83, Cl. D10-15.000.

Cillario, Renzo, to Ferrero S.p.A. Packaging container. 269,323, 6-14-83, Cl. D9-424.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; Ishii, Kenshun; and Ishige, Yukio, 269,305, Cl. D2-292.000.
Nakao, Shinroku; Ishii, Yoshiyasu; Ishii, Kenshun; and Fujiyama, Tetsumi, 269,376, Cl. D24-36.000.

Congdon, George L.: *See*—
Belt, Kenneth W.; and Congdon, George L., 269,373, Cl. D24-17.000.

Conti, Rino, to Dart Industries Inc. Condiment shaker or the like. 269,315, 6-14-83, Cl. D7-54.000.

Conti, Rino, to Dart Industries Inc. Granual dispenser or the like. 269,316, 6-14-83, Cl. D7-54.000.

Daniel E. Gelles Associates, Inc.: *See*—
Marks, Vincent L., Jr., 269,312, Cl. D6-175.000.

Dart Industries Inc.: *See*—
Conti, Rino, 269,315, Cl. D7-54.000.
Conti, Rino, 269,316, Cl. D7-54.000.
Fox, Peter M., 269,319, Cl. D7-360.000.
Gremonprez, Dan E.; Painter, David L.; and Cesaroni, William, 269,320, Cl. D7-360.000.
Swett, James B.; Bateman, Robert F.; and Boucher, Richard A., 269,313, Cl. D7-3.000.

d'Avila, Thomas G. Window security grating. 269,380, 6-14-83, Cl. D25-53.000.

Dieter, Berthold B.; and Gibson, Charles L., to Dieter, Berthold B. Playground climber. 269,363, 6-14-83, Cl. D21-245.000.

Dieter, Berthold B.; and Gibson, Charles L., to Dieter, Berthold B. Playground climber. 269,364, 6-14-83, Cl. D21-245.000.

Doyle, Richard; and Rivera, Lester, to Leviton Manufacturing Co., Inc. Combined receptacle and ground fault circuit interrupter. 269,341, 6-14-83, Cl. D13-30.000.

Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, to Leviton Manufacturing Co., Inc. Electronic receptacle. 269,342, 6-14-83, Cl. D13-30.000.

Eubanks, Mack W. Wheelbarrow enlargement insert. 269,335, 6-14-83, Cl. D12-24.000.

F.LLI Guzzini S.p.A.: *See*—
Pozzi, Ambrogio, 269,317, Cl. D7-317.000.

Fenne, Kenneth R., to Pittway Corporation. Housing for a fire and smoke detector. 269,331, 6-14-83, Cl. D10-106.000.

Fenne, Kenneth R., to Pittway Corporation. Housing for a fire and smoke detector. 269,332, 6-14-83, Cl. D10-106.000.

Ferenc, Robert A., to Whelen Engineering Company, Inc. Reflector for a warning light. 269,333, 6-14-83, Cl. D10-114.000.

Ferrero S.p.A.: *See*—
Cillario, Renzo, 269,323, Cl. D9-424.000.

Fox, Peter M., to Dart Industries Inc. Wok. 269,319, 6-14-83, Cl. D7-360.000.

Fujiyama, Tetsumi: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; Ishii, Kenshun; and Fujiyama, Tetsumi, 269,376, Cl. D24-36.000.

Gambello, Vincent J.: *See*—
Payne, Calvin L., Jr.; Gambello, Vincent J.; Snoke, Phillip J.; Jones, William G.; and Sansoni, Ricky L., 269,345, Cl. D14-107.000.

General Housewares Corp.: *See*—
Blanchard, Curtis R., 269,318, Cl. D7-312.000.

Gerity Products, Inc.: *See*—
Zannini, Joseph A., 269,321, Cl. D7-388.000.

Gibson, Charles L.: *See*—
Dieter, Berthold B.; and Gibson, Charles L., 269,363, Cl. D21-245.000.
Dieter, Berthold B.; and Gibson, Charles L., 269,364, Cl. D21-245.000.

Goessling, John G.; and Lage, David P., to Quick Point, Inc. Key holder. 269,308, 6-14-83, Cl. D3-61.000.

Goodyear Tire & Rubber Company, The: *See*—
Yurkovich, Charles G., 269,336, Cl. D12-146.000.

Gordon Barlow Design: *See*—
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Gremonprez, Dan E.; Painter, David L.; and Cesaroni, William, to Dart Industries Inc. Skillet-oven. 269,320, 6-14-83, Cl. D7-360.000.

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CLASS 139

66 R 4,387,741
92 4,387,742
110 4,387,743
429 4,387,744

CLASS 140

92.1 4,387,745
105 4,387,746

CLASS 141

1 4,387,747
57 4,387,748
68 4,387,749
331 4,387,750

CLASS 144

30 4,387,751
34 E 4,387,752
193 D 4,387,753

CLASS 148

1.5 4,388,121
12 F 4,388,122
4,388,123
404 4,388,124
428 4,388,125

CLASS 149

14 4,388,126

CLASS 152

209 R 4,387,754
4,387,755
4,387,756
4,387,757
353 R 4,387,758
4,387,759

CLASS 156

53 4,388,127
64 4,388,128
73.1 4,388,129
85 4,388,130
89 4,388,131
153 4,388,132
245 4,388,133
248 4,388,134
250 4,388,135
252 4,388,136
275.5 4,388,137
289 4,388,138
307.5 4,388,139
345 4,388,140
432 4,388,141
446 4,388,142
475 4,388,143
538 4,388,144
617 R 4,388,145
626 4,388,146
646 4,388,147

CLASS 157

1.1 Re.31,273

CLASS 160

229 R 4,387,760

CLASS 162

26 4,388,148
153 4,388,149
175 4,388,150

CLASS 164

437 4,387,761

CLASS 165

1 4,387,762
29 4,387,763
95 Re.31,274
119 4,387,764
166 4,387,765
172 4,387,766

CLASS 166

72 4,387,767
256 4,387,768
295 4,387,769
305 R 4,387,770
341 4,387,771

CLASS 172

311 4,387,772

CLASS 174

5 R 4,388,484
23 C 4,388,485
34 4,388,486
36 Re.31,277
40 R 4,388,487
92 4,388,488

CLASS 175

4.6 4,387,773
40 4,387,774
135 4,387,775

293 4,387,776

CLASS 177

43 4,387,777
207 4,387,778

CLASS 178

3 4,388,489

CLASS 179

1 B 4,388,490
1 G 4,388,494
1 GA 4,388,492
1 GD 4,388,493
1 GS 4,388,496
1 SC 4,388,491
1 SD 4,388,495
77 4,388,497
81 R 4,388,498
4,388,499
170 NC 4,388,500
175.3 R 4,388,501
179 4,388,502

CLASS 180

9.5 4,387,779
54 A 4,387,780
65 B 4,387,781
132 4,387,782
165 4,387,783

CLASS 181

131 4,387,784
142 4,387,785
150 4,387,786
155 4,387,787
171 4,387,788
224 Re.31,275

CLASS 188

1.11 4,387,789
65.3 4,387,790
77 R 4,387,791
328 4,387,792

CLASS 192

0.02 R 4,387,793
18 B 4,387,794
60 4,387,795

CLASS 198

374 4,387,796
461 4,387,797
587 4,387,798
735 4,387,799
750 4,387,800
821 4,387,801

CLASS 200

5 R 4,388,503
76 4,388,504
83 C 4,388,505
144 R 4,388,506
148 R 4,388,507
153 C 4,388,508
157 4,388,509

CLASS 201

2 4,388,151
6 4,388,152

CLASS 202

248 4,388,153

CLASS 203

35 4,388,154

CLASS 204

1 T 4,388,155
14 N 4,388,156
15 4,388,157
27 4,388,158
33 4,388,159
38 R 4,388,160
43 S 4,388,161
78 4,388,162
101 4,388,163
192 SP 4,388,164
196 4,388,168
207 4,388,169
403 4,388,166
418 4,388,165
420 4,388,167

CLASS 206

45 4,387,802
204 4,387,803
218 4,387,804
230 4,387,805
232 4,387,806
312 4,387,807
432 4,387,808
526 4,387,809

CLASS 208

8 LE 4,388,170
4,388,171
10 4,388,172
11 R 4,388,173
4,388,174
74 4,388,175
80 4,388,176
111 4,388,177
115 4,388,178
177 4,388,179

CLASS 209

5 4,388,180
12 4,388,181
17 4,388,182
139 A 4,388,183

CLASS 210

96.2 4,388,184
136 4,388,185
170 4,388,186
232 4,388,187
242.3 4,388,188
452 4,388,191
490 4,388,189
522 4,388,190
615 4,388,192
658 4,388,193
697 4,388,194
709 4,388,195
742 4,388,196
777 4,388,197

CLASS 211

49 D 4,387,810
119 4,387,811

CLASS 212

176 4,387,812
195 4,387,813
4,387,814

CLASS 215

1 C 4,387,815
4,387,816
217 4,387,817
256 4,387,818
273 4,387,819
320 4,387,820
330 4,387,821
4,387,822

CLASS 219

8.5 4,388,510
10.55 R 4,388,511
56.22 4,388,512
58 4,388,513
69 R 4,388,514
110 4,388,515
119 4,388,516
121 LJ 4,388,517
455 4,388,518
463 4,388,519
464 4,388,520
521 4,388,521
522 4,388,522
541 4,388,523

CLASS 220

4 R 4,387,823
23.4 4,387,824
234 4,387,825
243 4,387,826
269 4,387,827
284 4,387,828
374 4,387,829
456 4,387,830

CLASS 221

25 4,387,831
63 4,387,832

CLASS 222

95 4,387,833
278 4,387,834

CLASS 224

32 A 4,387,835
4,387,836
42.21 4,387,837
170 4,387,838
265 4,387,839
314 4,387,840

CLASS 226

97 4,387,841
113 4,387,842
118 4,387,843

CLASS 228

113 4,387,844
222 4,387,845

CLASS 229

54 R 4,387,846

CLASS 232

43.1 4,387,847

CLASS 235

380 4,388,524

CLASS 239

6 4,387,849
124 4,387,850
135 4,387,851
143 4,387,852
284 R 4,387,853
570 4,387,854
659 4,387,855

CLASS 241

28 4,387,856
101 B 4,387,857
152 A 4,387,858
262 4,387,859
282.1 4,387,860

CLASS 242

75.47 4,387,861
107.6 4,387,862
118.4 4,387,863
199 4,387,864

CLASS 244

3.1 4,387,865
7 C 4,387,866
12.2 4,387,867
31 4,387,868
207 4,387,869

CLASS 246

122 R 4,387,870

CLASS 248

58 4,387,871
221.3 4,387,872
226.4 4,387,873
396 4,387,874
480 4,387,875
571 4,387,876

CLASS 249

9 4,387,877

CLASS 250

211 J 4,388,525
214 R 4,388,526
4,388,527
221 4,388,528
270 4,388,529
427 4,388,531
578 4,388,532

CLASS 251

30 4,387,878
149.1 4,387,879
285 4,387,880

CLASS 252

28 4,388,198
33.6 4,388,199
34 4,388,200
49.6 4,388,201
52 A 4,388,202
70 4,388,203
98 4,388,204
135 4,388,205
148 4,388,206
174.11 4,388,207
175 4,388,208
182 4,388,209
182.1 4,388,210
356 4,388,212
392 4,388,213
4,388,214
402 4,388,215
412 4,388,216
413 4,388,217
417 4,388,218
429 B 4,388,220
429 C 4,388,219
435 4,388,221
437 4,388,222
4,388,223
455 Z 4,388,224
463 4,388,225
470 4,388,226
510 4,388,227
522 R 4,388,228
549 4,388,229
600 4,388,230
631 4,388,231

CLASS 254

89 H 4,387,881

CLASS 256

17 4,387,882

CLASS 260

112 B 4,388,232
112.5 R 4,388,233
4,388,234
4,388,236
112.5 T 4,388,235
239 BB 4,388,239
4,388,240
239 BC 4,388,237
239 E 4,388,238
397.1 4,388,241
397.2 4,388,242
4,388,243
404.5 4,388,244
453 AB 4,388,245
453 P 4,388,246
463 4,388,247
465 F 4,388,249
4,388,250
465.3 4,388,248
544 D 4,388,251
968 4,388,252

CLASS 261

88 4,388,253

CLASS 264

3 C 4,388,254
29.1 4,388,255
41 4,388,256
82 4,388,257
129 4,388,258
153 4,388,259
168 4,388,260
171 4,388,261
176 R 4,388,262
257 4,388,263
281 4,388,264
297.2 4,388,265

CLASS 266

158 4,387,883
246 4,387,884

CLASS 267

125 4,387,885

CLASS 269

71 4,387,886
100 4,387,887
324 4,387,888

CLASS 271

10 4,387,889
225 4,387,890

CLASS 272

70.3 4,387,891
76 4,387,892
118 4,387,893
130 4,387,894

CLASS 273

67 B 4,387,895
195 A 4,387,896
276 4,387,897
411 4,387,898

CLASS 277

34.3 4,387,899
101 4,387,900
165 4,387,901
203 4,387,902
212 FB 4,387,903
235 B 4,387,904

CLASS 279

1 C 4,387,905
2 A 4,387,906
4 4,387,907

CLASS 280

63 4,387,908
104 4,387,909
449 4,387,910
802 4,387,911
804 4,387,912

CLASS 282

27.5 4,387,913

CLASS 285

139 4,387,914
330 4,387,915

CLASS 290

1 R 4,388,533

CLASS 292

5 4,387,916
40 4,387,917
224 4,387,918
296 4,387,919
340 Re.31,276

CLASS 293

117 4,387,920

CLASS 294

1 CA 4,387,921
31.2 4,387,922

CLASS 296

201 4,387,923

CLASS 297

188 4,387,924
201 4,387,925
375 4,387,926
445 4,387,927

CLASS 299

33 4,387,928
39 4,387,929

CLASS 301

46 4,387,930

CLASS 303

1 4,387,931
22 A 4,387,933
24 F 4,387,932
116 4,387,934

CLASS 307

66 4,388,534
113 4,388,535
268 4,388,536
297 4,388,537
482 4,388,538
491 4,388,539
493 4,388,540
530 4,388,541

CLASS 308

10 4,387,935
4,387,936
184 R 4,387,938
217 4,387,939

CLASS 310

11 4,388,542
13 4,388,543
71 4,388,544
156 4,388,545
196 4,388,546
266 4,388,547
268 Re.31,278
365 4,388,548

CLASS 312

184 4,387,940
194 4,387,941
334 4,387,942

CLASS 313

138 4,388,549
346 R 4,388,551
414 4,388,552
4,388,553
505 4,388,554
585 4,388,550

CLASS 315

4 4,388,555
14 4,388,556
74 4,388,557
77 4,388,558
78 4,388,559
111.81 4,388,560
171 4,388,561
205 4,388,562
4,388,563
227 R 4,388,564
291 4,388,565
4,388,566
4,388,567
411 4,388,568

CLASS 318

87 4,388,569
255 4,388,570
293 4,388,571
317 4,388,572
376 4,388,573
443 4,388,574
475 4,388,575
571 4,388,576
717 4,388,577
729 4,388,578
732 4,388,579
787 4,388,580
789 4,388,581

CLASS 320

20 4,388,582
46 4,388,583
48 4,388,584

CLASS 322

47 4,388,585

CLASS 323

283 4,388,586
4,388,587

CLASS 324

72.5 4,388,588
96 4,388,589
103 P 4,388,590
158 P 4,388,591
247 4,388,592
262 4,388,593
348 4,388,594

CLASS 329

104 4,388,595

CLASS 331

1 A 4,388,596
2 4,388,597
4 4,388,598

CLASS 333

150 4,388,599
151 4,388,600
227 4,388,601

CLASS 335

212 4,388,602

CLASS 337

158 4,388,603
197 4,388,604
301 4,388,605

CLASS 338

15 4,388,606
22 SD 4,388,607

CLASS 339

59 R 4,387,943
4,387,944
4,387,945
66 M 4,387,946
90 R 4,387,947
97 R 4,387,948
125 R 4,387,949
136 M 4,387,950
193 R 4,387,951

CLASS 340

24 4,388,608
84 4,388,609
347 DA 4,388,612
347 P 4,388,613
347 SH 4,388,611
384 E 4,388,614
516 4,388,615
587 4,388,616
594 4,388,617
636 4,388,618
682 4,387,937
727 4,388,619
744 4,388,620
802 4,388,621

CLASS 343

14 4,388,622
709 4,388,623
727 4,388,624
786 4,388,625
854 4,388,626

CLASS 346

75 4,388,627
76 PH 4,388,628
81 4,388,629
140 R 4,388,630
141 4,388,631

CLASS 350

8.9 4,387,952
96.14 4,387,953
96.15 4,387,954
96.19 4,387,955
96.20 4,387,956
96.21 4,387,957
96.23 4,387,958
128 4,387,959
164 4,387,960
296 4,387,961
310 4,387,962
331 R 4,387,964
331 T 4,387,963
349 4,387,965
360 4,387,966
423 4,387,967
429 4,387,968
462 4,387,969
463 4,387,970
500 4,387,971
536 4,387,972
582 4,387,973

CLASS 351

208 B1 4,196,979
210 4,387,974

CLASS 354

25 4,387,975
33 4,387,976
60 R 4,387,977
187 4,387,978

CLASS 355

3 CH 4,387,980
3 DD 4,387,982
3 R 4,387,979
3 SH 4,387,981
8 4,387,983
12 4,387,984
71 4,387,985

75 4,387,986
133 4,387,987

CLASS 356

1 4,387,988
71 4,387,989
244 4,387,990
246 4,387,991
4,387,992
336 4,387,993
360 4,387,994

CLASS 357

15 4,388,632
17 4,388,633
34 4,388,634
38 4,388,635
49 4,388,636

CLASS 358

10 4,388,637
27 4,388,638
4,388,639
44 4,388,640
51 4,388,641
60 4,388,642
84 4,388,644
123 4,388,643
147 4,388,645
160 4,388,646
166 4,388,647
4,388,648
195.1 4,388,649
197 4,388,650
206 4,388,651
285 4,388,652
302 4,388,653
343 4,388,654

CLASS 360

19.1 4,388,655
33.1 4,388,656
72.1 4,388,657
85 4,388,658
90 4,388,659
110 4,388,660
112 4,388,661
113 4,388,662
128 4,388,663

CLASS 361

93 4,388,664
119 4,388,665
149 4,388,666
231 4,388,667
283 4,388,668
319 4,388,669
367 4,388,670
383 4,388,671
412 4,388,672

CLASS 362

183 4,388,673
186 4,388,674
225 4,388,675
260 4,388,676
276 4,388,677
293 4,388,678
306 4,388,679
368 4,388,680
374 4,388,681

CLASS 364

200 4,388,682
4,388,683
4,388,684
4,388,685
4,388,686
4,388,687
4,388,688
401 4,388,689
483 4,388,690
510 4,388,691
557 4,388,692
724 4,388,693
834 4,388,694
900 4,388,695
4,388,696
4,388,697
4,388,698

CLASS 365

8 4,388,699
11 4,388,700
77 4,388,701
104 4,388,702
105 4,388,703
154 4,388,704
210 4,388,705
226 4,388,706
230 4,388,707

CLASS 366

2 4,387,995
4 4,387,996
79 4,387,997
130 4,387,998

CLASS 367

2 4,388,708
131 4,388,709
134 4,388,710
135 4,388,711

CLASS 368

15 4,387,999
72 4,388,000
87 4,388,001
88 4,388,002

CLASS 369

10 4,388,712
50 4,388,713
173 4,388,714

CLASS 370

13 4,388,715
29 4,388,716
62 4,388,717
110.1 4,388,718

CLASS 371

27 4,388,719

CLASS 372

76 4,388,720
107 Re.31,279

CLASS 373

31 4,388,721
118 4,388,722

CLASS 374

41 4,388,003

CLASS 375

1 4,388,723
14 4,388,724
36 4,388,725
44 4,388,726
88 4,388,727

CLASS 376

164 4,388,266
247 4,388,267
272 4,388,268
442 4,388,269

CLASS 378

34 4,388,728
45 4,388,530

CLASS 382

8 4,388,610

CLASS 384

397 4,388,004

CLASS 400

144.2 4,388,005
195 4,388,006
314 4,388,007
578 4,388,008
679 4,388,009
692 4,388,010

CLASS 401

173 4,388,011

CLASS 403

142 4,388,012
277 4,388,013
369 4,388,014

CLASS 404

2 4,388,015
48 4,388,016
112 4,388,017
113 4,388,018

CLASS 405

25 4,388,019
138 4,388,020
184 4,388,021
195 4,388,022
4,388,023
198 4,388,024
212 4,388,025

CLASS 406

130 4,388,026

CLASS 409

131 4,388,027
136 4,388,028
295 4,388,029

CLASS 410

69 4,388,030

CLASS 411

43 4,388,031

CLASS 414

95 4,388,032
282 4,388,033
331 4,388,034
417 4,388,035
537 4,388,036
607 4,388,037
685 4,388,038
748 4,388,039

CLASS 415

174 4,388,040

CLASS 416

119 4,388,041
198 A 4,388,042

CLASS 417

36 4,388,043
38 4,388,044
54 4,388,045
295 4,388,046
299 4,388,047
310 4,388,048
396 4,388,049
454 4,388,050
505 4,388,051
540 4,388,052
542 4,388,053

CLASS 419

32 4,388,054

CLASS 420

473 4,388,270

CLASS 422

56 4,388,271
102 4,388,272
117 4,388,273
177 4,388,274
180 4,388,275
187 4,388,276
211 4,388,277

CLASS 423

22 4,388,279
131 4,388,280
210 4,388,281
242 4,388,282
4,388,283
295 4,388,284
329 4,388,285
348 4,388,286
415 P 4,388,287
416 4,388,288
447.4 4,388,289
468 4,388,290
488 4,388,278
515 4,388,291
555 4,388,292
573 R 4,388,293
599 4,388,294

CLASS 424

253 B1 4,355,032
1 4,388,295
4,388,296
78 4,388,297
89 4,388,298
92 4,388,299
114 4,388,300
150 4,388,302
154 4,388,301
162 4,388,303
177 4,388,304
4,388,305
4,388,306
4,388,307
180 4,388,308
4,388,309
200 4,388,310
238 4,388,311
244 4,388,312
4,388,313
246 4,388,314
4,388,315
4,388,316
248.51 4,388,317
251 4,388,318
270 4,388,319
274 4,388,320
279 4,388,321
304 4,388,322
305 4,388,323
312 4,388,324
319 4,388,325
335 4,388,326

CLASS 425

80.1 4,388,055
83.1 4,388,056
97 4,388,057
110 4,388,058
112 4,388,059
150 4,388,060
392 4,388,061

CLASS 426

2 4,388,327
3 4,388,328
40 4,388,329
51 4,388,330
63 4,388,331
88 4,388,332
104 4,388,333
112 4,388,334
243 4,388,335
551 4,388,336
573 4,388,337
590 4,388,338
602 4,388,339
614 4,388,340
656 4,388,341

CLASS 427

242 B1 3,400,012
8 4,388,342
14.1 4,388,343
38 4,388,344
54.1 4,388,345
58 4,388,346
96 4,388,347
208.4 4,388,349
262 4,388,350
304 4,388,351
391 4,388,352
422 4,388,353

CLASS 428

12 4,388,354
31 4,388,355
35 4,388,356
57 4,388,357
71 4,388,358
143 4,388,359
172 4,388,360
192 4,388,361
211 4,388,362
215 4,388,363
253 4,388,364
258 4,388,365
285 4,388,366
323 4,388,367
336 4,388,368
339 4,388,369
368 4,388,370
383 4,388,371
395 4,388,372
413 4,388,373
414 4,388,374
423.7 4,388,375
425.9 4,388,376
446 4,388,377
537 4,388,378
613 4,388,379

CLASS 429

91 4,388,380
104 4,388,381
111 4,388,382
4,388,383
4,388,384
4,388,385

CLASS 430

5 4,388,386
7 4,388,387
30 4,388,389
48 4,388,390
49 4,388,391
58 4,388,392
59 4,388,393
94 4,388,394
114 4,388,395
126 4,388,396
197 4,388,397
212 4,388,398
258 4,388,388
271 4,388,399
346 4,388,400
505 4,388,401
527 4,388,402
546 4,388,403
548 4,388,404

CLASS 431

10 4,388,062
19 4,388,063
265 4,388,064
362 4,388,065

CLASS 432

1 4,388,066
14 4,388,067
122 4,388,068

CLASS 433

228 4,388,069

CLASS 435

107 4,388,405
189 4,388,406

CLASS 436

3 4,388,407
60 4,388,408
80 4,388,409
85 4,388,410
149 4,388,411
536 4,388,412

CLASS 440

89 4,388,070

CLASS 455

72 4,388,729
208 4,388,730
221 4,388,731
608 4,388,732

CLASS 493

333 4,388,071
410 4,388,072
444 4,388,073

CLASS 494

81 4,387,848

CLASS 501

40 4,388,413
98 4,388,414
136 4,388,415
4,388,416

CLASS 521

26 4,388,417
56 4,388,418
103 4,388,419
127 4,388,420

CLASS 523

106 4,388,428
118 4,388,421
137 4,388,422
153 4,388,423
219 4,388,424
333 4,388,425
462 4,388,426
500 4,388,427

CLASS 524

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	292	269,305			269,320		114	269,333	D15—	139	269,348		150	269,362			269,376
	400	269,306		383	269,347	D11—	158	269,334		144	269,349		245	269,363		41	269,377
D3—	32	269,307		388	269,321	D12—	24	269,335	D16—	14	269,350			269,364		54	269,378
	61	269,308	D9—	318	269,322		146	269,336	D17—	20	269,351	D22—	27	269,365		64	269,379
D6—	36	269,309		424	269,323			269,337			269,352			269,366	D25—	53	269,380
	85	269,310		433	269,324		147	269,338	D18—	2	269,353	D23—	8	269,367	D27—	51	269,381
	129	269,311			269,325		318	269,339		7	269,354		97	269,368			269,382
	175	269,312			269,326		319	269,340			269,355	D24—	1.1	269,369			269,383
D7—	3	269,313		448	269,327	D13—	30	269,341			269,356		9	269,370	D30—	2	269,384
	54	269,315	D10—	15	269,328			269,342	D19—	45	269,357		10	269,371			269,385
		269,316		18	269,329	D14—	6	269,343	D21—	9	269,358		17	269,372		16	269,386
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